



Faculty of Agricultural Technology Universitas Gadjah Mada





**FAKULTAS
TEKNOLOGI
PERTANIAN**



- TP1-KANTOR, KULIAH & LAB
- TP2-AUDITORIUM
- TP3-R. DOSEN & R. KEMHS
- TP4-R. KULIAH & LAB
- TP5-R. KULIAH & LAB
- TP6-R. LABORATORIUM
- M - MASJID

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Introduction

The Faculty of Agricultural Technology is one faculty among 18 faculties in Universitas Gadjah Mada (UGM), Yogyakarta, Indonesia and it was established on September 19th, 1963. The focus of study is to develop and apply science, knowledge and technology in agriculture covering food processing of agricultural products, agricultural engineering, and agroindustrial technology. Agricultural technology covers knowledge to utilize, to process and manage the natural resources and biomass in agriculture for human needs and human welfares in an environmentally, friendly, healthy, clean and sustainable ways.

In the system of industrial economic, agroindustry defined as industries and groups of farmers that can provide foods and non-food agricultural materials for the people. Efforts to develop the quantity and quality of the agricultural products, to establish better agroindustries, and make a better environment, require human resources who have the knowledge in food engineering, food processing technology, and agroindustrial technology.

Agricultural technology will be one of the main pillars of the nation development and welfare through the development of agroindustry. The students who enrolled the faculty will be educated and trained to be a scientist with the capability to develop sciences, knowledge and technologies in the field of agroindustry. Furthermore to enhance the competitiveness of the students, the faculty supports the students enterprenuership program through course, laboratory experiences, and national or international students programs which encourage their creativity.

VISION

To bring the Faculty of Agricultural Technology – Universitas Gadjah Mada as International Center of Excellence by implementing Three Pillars of Higher Education (*TriDharma*) on Agroindustry.

MISSION

1. To conduct synchronization of governance on academic executing units
2. To increase harmonization of relationship among faculty members
3. To accelerate human resources development including lecturers and academic supporting staffs become more competence and professional.
4. To sharpen the recognition and reputation of Faculty of Agricultural Technology through strengthening collaboration network.
5. To ensure the establishment of center excellence on agroindustry through education, research and community services.





FACULTY GOVERNANCE

For achieving and realizing the vision and mission of faculty, the faculty governance was built based on the needs and university governance. In period of 2012 – 2016 the dean is supported by four vice deans, who are covering all aspects at faculty level. The academic and students affair are coordinated by Vice Dean I and Vice Dean II is responsible for researches and community services. The Vice Dean III has responsibilities for finance, asset, human resources and information system, while Vice Dean IV has duties in alumni, collaboration and business development.

Some supporting units in the faculty, which are covered from academic to alumni, are Quality Management Unit (UMM), Computer and Information Unit (TIK), Journal AGRITECH, Unit of Technological and Management of Agroindustry Development (UPTMA), Agricultural Technology Career Center (ATCC) etc.



ROADMAP FACULTY DEVELOPMENT

Within deanship period 2012 -2016 some steps are set-up to pursue the faculty mission, as follow: In 2012 Synchronization Governance and Harmonization of Academic Atmosphere was completed, in 2014 Acceleration of Human Resources Competencies should be achieved and finally in 2016 Recognition and Center of Excellence from national and international partners could be realized.

Some activities and partnerships with international and national level have been established recently, that could accelerate realization of milestones for reaching the ultimate faculty goals. Some partnership or as member in scientific networks are listed as follow: Six Universities Indonesian Japan Initiatives (SUIJI), ASEAN University Consortium for Food and Agro-based Engineering and Technology (AUCFA), University Network for Tropical Agriculture (UNTA), Center for Advanced Studies for Agriculture and Food (CASAF), Asian Federation of Societies on Lactic Acid Bacteria (AFSLAB), German Alumni Food Network (GAFOON), Mycotoxin Reduction Program (MYCORED), System of Rice Intensification (SRI) with JIRCAS, Food Safety Intensive Course – Kagawa University, etc.

Some foreign university partners are College of Life Sciences and Biotechnology – Korea University, Faculty of Agriculture and Graduate School of Agriculture – Kagawa University, Graduate School of Agriculture – Kyoto University, Faculty of Engineering and Agro-Industry, Maejo University, Center for IT Convergence Agricultural Machinery – Chonbuk National University, Seoul National University, Faculty of Agriculture – Yamagata University, Faculty of Bioscience Engineering – University of Ghent, School of Bioresources and Technology King Mongkut's University of Technology Thonburi, Faculty of Engineering –Universiti Putra Malaysia, Institute of Biochemistry – Graz University of Technology, University of Natural Sciences (BOKU) – Vienna, Tasmanian Institute of Agricultural Research – University of Tasmania, etc.

At national level the faculty has network or collaboration with universities, association, governmental institutions, private companies and small medium enterprises especially on agroindustrial sector, such as PT Tiga Pilar Sejahtera (TPS) Food, PT Indofood Sukses Makmur, PT Bogasari Flour Mills, PT Tirta Investama, PT Yummy Food Utama, PT Paragon Technology and Innovation, PT Asian Agri, PT Perkebunan Nusantara, PT Sriboga Raturaya, PT Bank BRI Agro, INDOSAT, etc.

AUDITORIUM KAMARIJANI-SOENJOTO



FIGURES

Currently, the faculty is supported by 89 staffs, in which 51 of them hold PhD (19 staffs of them are professor) and 37 of them hold master, placed in 16 laboratories. Some supporting units within faculty are Incubator Laboratory, Quality Management Unit, Computer and Information Center, Agricultural Technology Career Center, and some common facilities which are coordinated by the university such as Center for Language Training, Center for Physical and Chemical Laboratories, Computer and Information Center, Unit of Education, Research and Development of Agriculture (KP4), and University Library.



The faculty has three departments, namely (1) Department of Food and Agricultural Product Technology, (2) Department of Agricultural Engineering, and (3) Department of Agroindustrial Technology. These three departments under faculty coordination offered study program at three levels namely undergraduate (S1), master (S2), and doctoral degrees (S3).

The name of every study programs are as follow; S1 consists of Food and Agricultural Product Technology, Agricultural Engineering and Agroindustrial Technology; S2 are Food Science and Technology, Estate Crop Technology, Agricultural Engineering and Agroindustrial Technology; and S3 offers Food Science and Agricultural Engineering and hopefully in 2015 S3 Program on Agro-industrial Technology will be launched.



Number of students based on December 2014 is undergraduate program (S1) at three departments 1,410 students; master program at 6 study programs 208 students and for two doctoral program 82 students. In addition, the faculty also offered workshop, joint research, and training in the fields of food science and technology, food and agricultural engineering, agroindustrial technology, postharvest technology, food biotechnology, food nutrition, animal product technology, fish technology, and supervision for solving problems in the field of agroindustry upon request.



TEACHING AND LEARNING FACILITIES

The faculty has excellent more than 15 class-rooms equipped with at least computer and LCD projector for supporting the teaching and learning process. Wifi is already installed within the campus several years ago to seek literatures easier and faster. The faculty has also a library with new book collections, national and international journals. Besides faculty library, the student can also use University Library Center and library of Center for Food and Nutrition Studies.



RESEARCH FACILITIES

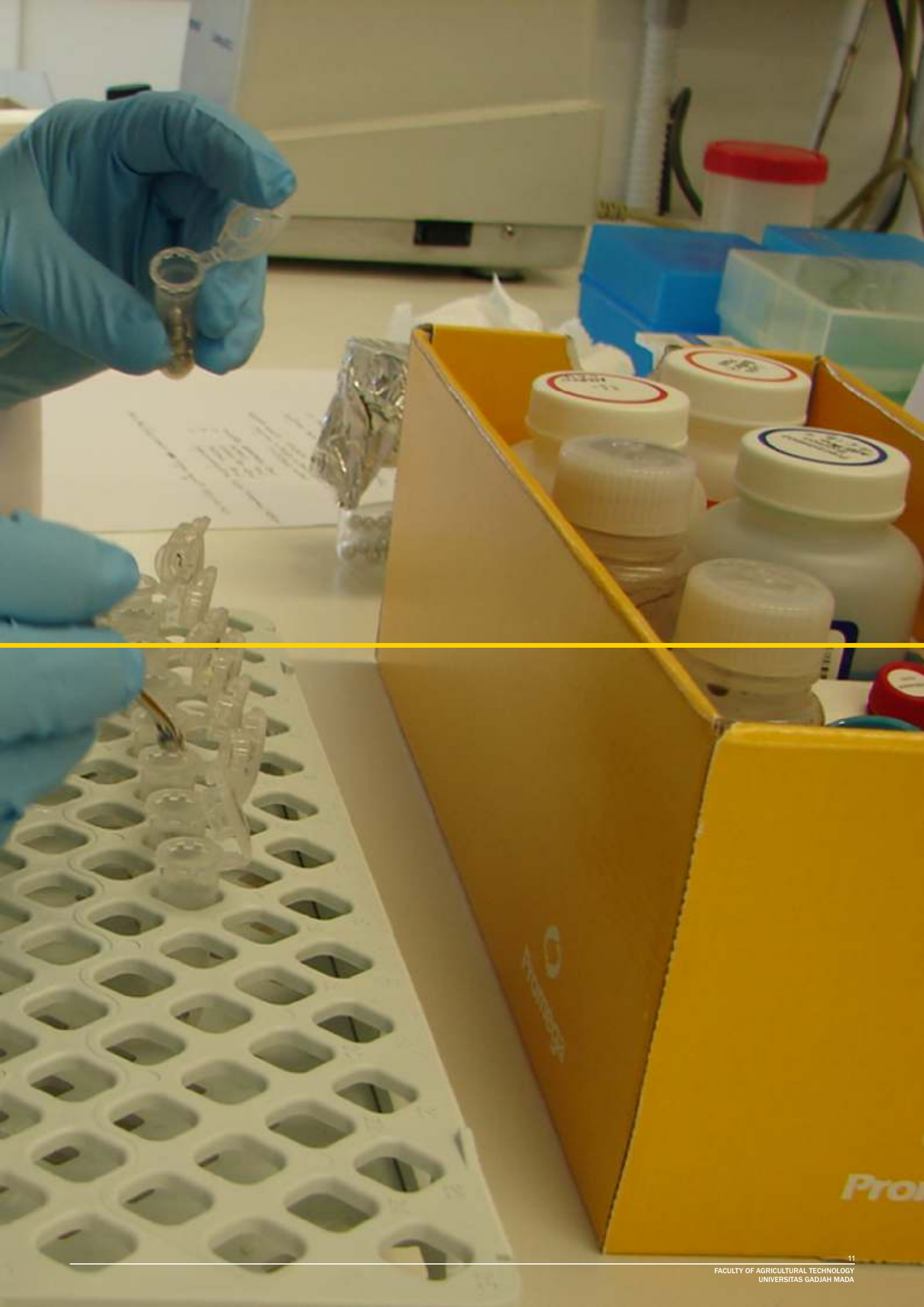


Faculty research policy is focused on achieving the center of excellence on agroindustry, which is divided into production technology (on-farm), postharvest technology and equipments, processing technology, and management. These are supported by some research groups that are developed by three departments based on their competencies. The competencies are represented by laboratories.

The faculty has 16 laboratories which are managed and coordinated by the departments and one Laboratory of Incubator, which is managed by faculty and three departments and is designed for preparing the prototype products to enter the market. The Incubator is commonly used by students or academic staffs for realizing their new developed products, before they are tested to the real market. Some activities for supporting students activities are such as producing house of designed food products under the Higher Education Directorate for Research and Community Services Program called Student Creativity Program (PKM) and also entrepreneurship program that is offered by some national and international institutions.



DEPARTMENT OF FOOD AND AGRICULTURAL PRODUCT TECHNOLOGY



Learning Outcomes / General Competencies

Department of Food and Agricultural Product Technology (DFAPT) accepts challenges in the development of human resources, science and technology. DFAPT has stated vision that its graduated students will be recognized in their main competencies by stakeholders (academician, industry, government and community). Providing graduated students with skills and knowledge in application of science and technology during processing of food and agricultural product including engineering process, chemistry, biology, and nutrition aspects are the objectives of learning process in DFAPT. Therefore, the learning outcomes are designed to provide the needs of stakeholders as followed:

- (1) the novel and comprehensive understanding concerning the issue of food and agricultural product technology from engineering process, chemistry, biology, and nutrition aspects;
- (2) the capability of the knowledge and expertise development through scientific methods;
- (3) the competence in application and delivering knowledge and technology in related to food and agricultural product.



Teaching and Learning Strategies

The delivery method is guided in the curriculum-based competencies (KBK) with orientation on student centered learning (SCL). The KBK is focused on the learning process with continuous process improvement. A range of 144 – 148 credits consisting of 113 credits of compulsory courses and approximately 31 - 35 credits of elective courses is required to accomplish the study in four years (eight semesters). Since the learning process is oriented in SCL and lecturers play role as facilitator therefore the strategy are student will have to actively participate in teaching and laboratory practices. Within this strategy, the collaboration of lecturer and student can be achieved to contribute the development of science and technology. The SCL is conducted in various delivery methods such as research-based learning (RBL), problem-based learning (RBL), case-based learning and collaborative learning.

The assessment will be carried out to evaluate the success of learning objectives. During learning process in classroom and laboratory practices, the comprehensive evaluation consists of assignments (homework), quizzes, delivered presentation and report performance of laboratory practices as well as midterm and final semester examination. The student performing field works in area of food and agricultural product industries will be guided and evaluated by their supervisors. This assessment can be observed by delivering the subject content of field work, the creative and critical thinking, the problem analysis and solving several assignments of plant design, as well as the final report of field works and plant design.

RESEARCHES

Group Researches

DFAPT currently has 12 research groups supporting the roadmap of research and community service in faculty level.

Research Groups	Current Topics
Lactic Acid Bacteria	Probiotic from indigenous lactic acid bacteria; Characterization of bacteriocin PAF-11 and its application for preservation of tofu; The use of lactic acid bacteria in tofu processing; The use of indigenous lactic acid bacteria in fermentation of milk; Supplementation of indigenous lactic acid bacteria in <i>tape</i> fermentation and Lactic acid fermentation of sorghum
Mycotoxins (CEMycoS)	Occurrence of aflatoxin and ochratoxin in agricultural products (corn, peanut, coffee); Prevention of aflatoxins formation during handling, storage, and marketing of grains
Postharvest Technology	Drying of corn and peanut as well as Packaging of local fruits (snake fruit, mango, mangosteen, etc.)
Functional Foods	Functional foods from soybean and local tubers; Immunostimulatory effect of local tubers; Resistant starch from modified sago starch; Laminaran from brown algae (<i>Sargassum duplicatum</i>)
Modification of Starch	Modification of sweet potato and cassava starch/flour (heat-moisture treatment, oxidation, and acidification) for noodle and bread
Antioxidant	Photooxidation of oil in foods; Antioxidant in white turmeric; Development of microemulsion containing singlet oxygen quencher for retarding photooxidation in dairy products; Development of microemulsion as carrier of hydrophilic antioxidant for preservation of virgin coconut oil; Characterization of microemulsion of fucoxanthine; Microemulsion of floratannin from seaweed (<i>Sargassum</i> sp.); Characterization of triterpenic acid from black potato (<i>Coleus tuberosus</i>) as antioxidant and antitumor; The fate of anthocyanins during lactic acid fermentation of glutinous black rice
Liquid Smoke	Production of liquid smoke; Development of preservative and flavoring agents from liquid smoke
Natural Flavoring Agents	Guanosine monophosphate-rich yeast extract for flavoring agent and 5 - Phosphodiesterase from bean sprout for guanosine monophosphate production
Utilization of Lignocellulosic Materials	Production of cellulase and xylanase from moulds; Development of biological pretreatment of oil palm empty fruit bunch by white-rot fungi for ethanol production
Energy from Plant Materials	Development of biodiesel from jatropa; Bioconversion of fruit waste into biogas
Lipase	The transesterification of oil for biodiesel production; The synthesis of cocoa butter equivalent; The synthesis of human milk fat analogue from coconut oil
Soybean	Immunostimulatory effect of black soybean tempe and baby foods from soybean; Process design for soy sauce production
Others	Microencapsulation of oleoresin from nutmeg; Development of thermostable amylase-producing <i>Brevibacillus</i> sp.

Laboratories

The research group mentioned above have interdisciplinary and collaboration among all laboratories in DFAPT and other departments. Research facilities and infrastructures have been supported by five laboratories in DFAPT consisting of **Food Chemistry and Biochemistry, Food and Nutrition, Food Process Engineering, Biotechnology, and Waste Management**. These five laboratories serve research activities for undergraduate and postgraduate students as well as the teaching staffs in DFAPT. Currently, the teaching laboratory has been established in order to serve the learning process for undergraduate and postgraduate students.

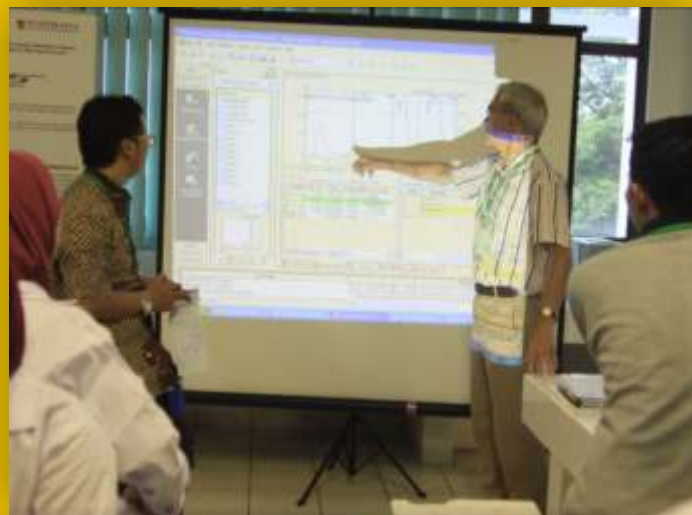


Community Services

Contribution in community services is implemented by utilization of science and technology based on the competency of DFAPT. These activities involve the stakeholders especially government, industry, small-medium enterprises and community in partner village through workshop, training, and problem solving of current issues. Most of activity is answering the food industry and community needs in area of food processing and engineering, food safety, sanitation and hygiene, food regulation and authenticity as well as waste management. Continuous facilitation in partner village has been designed to encourage community empowerment and emerge innovative food products in small medium enterprise. The role of DFAPT staff is also recognized in several food industries, local and national governments, especially references in food safety issues, formulation of national standard in food products, and national policy of food security. Generally, DFAPT are giving public services in order to enhances people's knowledge about food and agricultural product technology. Through this small contribution, will eventually give a great benefit to the nation.



<http://tphp.ugm.ac.id/>





DEPARTMENT OF AGRICULTURAL ENGINEERING

Agricultural Engineering (AE) emphasizes on the use of engineering and management in the process of biomass production to fulfill the people needs as well as to maintain the environmental sustainability. The primary aim of the Graduate of Agricultural Engineering is to educate the students to be able to do individual research and to create innovation and technology to become future professional scientist in the field of agriculture focusing on the appropriate engineering and management aspects.



General Competence

The students who have completed the program should be able to practice, apply and develop into a professional in the field of agricultural engineering. The students who have completed the program should have following competencies:

1. Have capability for designing, manufacturing, operating and managing the agricultural achineries and equipments, food processing facilities, as well as other agricultural facilities such as soil and water engineering
2. Have good analytical skills to solve the problem in the area of agricultural engineering
3. Have strong academic background to continue to the graduate program.

Teaching and Learning Strategies



Curriculum is constructor to accommodate both the requirements of the user (government, industrial sectors, and society) and the needs for the development of knowledge in agricultural engineering. To do so, the curriculum will be evaluated periodically. According to the defined curriculum, this program can be completed in 4 years consisting of 8 semesters. The minimum requirements for the graduation are at least 144 credits but not more than 148 credits comprising of 119 credits of compulsory courses and minimum 25 credits of elective courses. The graduate must achieve the minimum GPA is 2.00 and the maximum D score is less than 36 credits.



The Department of Agricultural Engineering offers three main concentrations:

- Agricultural Power and Machinery. This field of study offers the knowledge and skill to the students concerning about design, construction, operation and management of agricultural machineries and equipment
- Land and Water Resources Engineering. This field of study provides the students to be able to design and manage the land and water resources to increase the agricultural production
- Post-harvest and Food Engineering. This field of study provides the knowledge and skill to the student to analyze, design, operate, and manage agricultural products for more efficient and higher quality resulted products.



Most of teaching and research staffs of the DAE are Ph.D. holders from qualified universities around the world, such as United States, France, Philippines, Germany and Japan. Fields of specializations of the staffs consist of agricultural machinery and energy, post-harvest and food process engineering, and land and water resources engineering.

Student Assessment

In recent years, to improve the quality of the lecture, each lecturer who administers courses or practicum is required to prepare a handbook lecture handouts and course materials as well as practical user guide. With the support of institutional development programs (institutional capacity building), the Department of Agricultural Engineering has developed a RPKPS (Learning Activity Semester Program Plan) and teaching materials. In the future, RPKPS and teaching materials are expected to be continuously updated, accordance with the development of science. For the delivery of the course material, have already used the LCD viewer (multi media) other than OHP projector.

Student assessment is done in various ways, in addition to midterms and final exams, students are given quizzes, assignments (take home) and presentations, both individually and collectively (groups). In addition to the above components, the final value is also determined by the activity and the presence of students in the class.



Research Groups

To achieve the best results in conducting lectures, research, and community services, this program is supported by various facilities including laboratories (agricultural machinery laboratory, workshop laboratory, biophysics laboratory, land and water resources laboratory, agricultural building laboratory, post-harvest and food process engineering laboratory, and computer laboratory), libraries in university, faculty and department level, and fast and reliable internet connection.



Department of Agricultural Engineering have three main research groups:

1. Land and Water Resources Engineering

The application of engineering science and management in land and water resources are implemented to support agro-industrial environment.

The scope includes :

- Land and water Management, it is divided into: land evaluation, geographical information systems, engineering and agricultural land management, watershed management, development and management of water resources.
- Land and water conservation techniques are divided into: hydro-climatology, physics soil for soil and water conservation, erosion control and soil conservation techniques, water resource conservation techniques.
- Techniques and management of irrigation, include: engineering and design of irrigation systems, irrigation systems and management, micro irrigation systems.



2. Agricultural Power and Machinery

The application of the basic principles of engineering and management to develop and enhance the added value of future biological resources through conversion and energy conservation techniques also for strengthening the development and application of agricultural machinery worth for sustainable human development, sound environmental and natural resource sustainability. Agricultural power and machinery have some field studies:

- Energy Technology
 - Renewable Energy Development
 - Bioconversion Engineering
- Agro-industrial Machinery Engineering
 - Power and Energy Management
 - Design & Construction
 - Management of Machinery and Equipment
- Control and Automation
 - Measurement and Controls in Biological System
 - Precision & Smart Agriculture



3. Agricultural Product Processing

Application of the principles and concepts of engineering science in the handling, processing, security, and distribution of food and other agricultural products from harvest to the processing industry and to consumers. The topics studied include:

- Heat and mass processes: heat transfer in heat exchangers, freezing and thawing food, vaporization and coagulation, drying and preservation of food.
- Mechanical systems operating unit: downsizing process, including sedimentation and centrifugation separation, mixing and stirring.
- Rheological: handling liquid and solid foods.
- Postharvest: drying, storage, packaging.

RESEARCHES

Laboratories

To support research activities conducted by the four research groups, the department is supported by five laboratories, namely : Laboratory of Energy and Agricultural Machinery; Laboratory of Land and Water Resources Engineering; Laboratory of Food Engineering and Post-harvest; Laboratory of Environmental Engineering and Building Agriculture; Laboratory of Bio-physics.



COMMUNITY SERVICES

As our responsibility to the community, we have many community services to the village, home industries and other institutions.

1. Clean Irrigation Movements, in collaboration with Bantul district government and Indonesian Army. This program is held in Imogiri sub district, Bantul District, Yogyakarta Special Province. And Department of Agricultural Engineering becomes the pioneer of this program.
2. Community empowerment at Srimartani village, Piyungan sub district. In this program, we have collaboration with BAZNAS (Badan Amil Zakat Nasional). Several activities have done through this program :
 - a. Developing Agropolitan areas to support food security
 - b. Water management in System of Rice Intensification (SRI)
 - c. Introduction the gasifier to change biomass energy
 - d. Producing biogas from cow dung.
3. Develop a System of Rice Intensification (SRI) in some provinces, such as Yogyakarta, Central Java, East Java, Wes Java and South Sulawesi. Department of Agricultural Engineering became the pioneer in development of SRI.

4. Some trainings and workshops :
 - a. Post-harvest handling in rice, which held by Agricultural government institution of Kulon Progo district
 - b. Operating agricultural machinery, in collaboration with Agricultural Government Institution of Yogyakarta Province
 - c. Implementation of SNI 01-6729-2010 about organic food
 - d. Increase the productivity of livestock farming
 - e. Water resource management in implementation of SRI
 - f. Techniques of food processing in tubers
 - g. Climate change mitigation in related with agricultural



LIST OF COLLABORATION



The collaboration between Department of Agricultural Engineering and other institutions or universities around the world as shown below:

1. World Bank Indonesia Office
2. Singapore Management University, Singapore
3. JIRCAS (Japan International Research Center for Agricultural Sciences), Japan
4. Ehime University, Japan
5. Iwate University, Japan
6. Yamagata University, Japan
7. KSAM (Korean Society for Agricultural Machinery), Korea
8. National Agricultural Research Organization (NARO), Japan
9. Meteorological Research Institute - Japan Meteorological Agency (JMA), Japan



<http://tep.tp.ugm.ac.id/>



A woman wearing a white lab coat and a black hijab is shown in profile, working in a laboratory. She is looking towards a piece of green and red agricultural machinery. The background features large windows with black frames and a white door.

DEPARTMENT OF AGRO-INDUSTRIAL TECHNOLOGY



The Department of Agro-industrial Technology in the Faculty of Agricultural Technology, Universitas Gadjah Mada, was established in 8 December 1983. Since its establishment, the Program has a vision to be a center of excellence in system engineering, technology and management in the field of agroindustry. To achieve the vision, the Program sets itself the mission, to carry out high-quality education in the field of system engineering, technology and management of agroindustry through the implementation of the educational three pillars (Tri Dharma) of higher education in Indonesia and build mutual partnerships with national and international institutions.



Learning Outcomes/ General Competencies



The Department has a goal to be the first choice for students and professionals in finding the source of the agro-industry knowledge nationally and internationally with a strong inclination to be a leader in the pillars of **(1) systems engineering, (2) technology, and (3) management of agro-industry**. To produce professional agro-industrial technologists for the welfare of human beings, the Program provides students with capability and competency in the field of agro-techno-preneurship that can be defined as a character that actively upgrading the ability to mastering the newest knowledge in agro-industrial technology, system engineering and management. The learning outcomes of the program are therefore, to provide the knowledge and skill for students to be:

1. Mastering the fundamentals of management science and systems development, process and product industry, bio-industry, material handling, standardization and quality control, and industrial systems analysis.
2. Capable of solving problems of production systems, process transformation and product-oriented goods or services, productivity and added value.
3. Able to plan, design and develop equipment and machinery, process technology and co-product control based on cleaner production technology.
4. Able to analyze industrial system, conduct simulation and modeling of proper development based on information and communication technology (ICT).
5. Able to solve quality problems in terms of quality standardization and quality management system in agro-industry.
6. Able to apply decision-making analysis by considering the opportunity and risks of investment in the agro-industrial area.
7. Able to lead and work in groups and build networking.
8. Able to conduct research and development in the area of agro-techno-preneurship.

Teaching and Learning Strategies

In the learning process, the Department uses SCL approach. The problem-based, case-based and or research-based learning are types of SCL approach mostly applied by the lecturers. This approach is tailored according to the application level and the objectives of the courses. In the implementation of the teaching and learning process, the academic staff is assisted by senior students as instructor assistant, such as in laboratory exercises and tutorials. The applied approach enables students to acquire and uses knowledge academically. Furthermore, it also stimulates the students to perform better and more active in their learning process. Examination and assessment are conducted in three ways, namely (a) courses; (b) laboratory exercises; and (c) field work and thesis. Access to the internet is provided by the Faculty to facilitate the students in their active involvement in the learning process.

Utilization of e-Lisa as an e-learning system provided by the University is also gaining student participation. In addition, there are on-line or internet-based method, seminars, field/company visits, field works in industry, and even a community service activity. Nevertheless, classes are still main forum for the students and lecturers to interact.

Community service as carried out in extramural service (KKN) is considered as compulsory. In addition, there is opportunity for student to get involved in community service activities conducted by the Department or by other units in Universitas Gadjah Mada such as faculties or study centers (<http://tip.ugm.ac.id>). Exchange programs have also been taken into action, involving the students and the lecturers, locally and internationally.

Student Assessment

Assessment and examination of laboratory exercise are conducted by lecturers in charge with the help of several senior students who are selected as instructor assistants based on their academic merits. The points for assessing student performance are based on pre-test, performance of report, practical skill, and response test with the percentage of contribution to the final score determined by lecturers in charge. The scoring and grading process are the same as those of compulsory and optional courses in the above section.



A different method of assessment and examination and assessment is made for students who take field work and thesis. Student performance in conducting on the job training and thesis is assessed by a supervisor and two supervisors respectively. The assessment is on the bases of his/her writing skill, oral presentation skill, cognitive skill, persistence and diligence during proposal preparation, implementation, and report writing. With the same bases of assessment, students are examined by the same supervisors and one additional reviewer/examiner appointed by the department. Especially for thesis examination, details and comprehensive questions related to fundamental knowledge of research being taken are also put forwarded since thesis examination is set as an exit test—measuring student's general understanding of all courses already taken. The final score is then graded using letter grades (A, B, C, D, and E) as those explained above.

RESEARCHES

Research Groups



Implementation research is one of the mandates given to the higher education sector, including the Department of Agro-industrial Technology, which is one of the departments at the Universitas Gadjah Mada. The results of a study are expected to resolve the problems faced in the environment / country where a research unit is located. It is almost impossible to solve the problems merely from one field of science, so that a comprehensive study is required in order to provide solutions to the problems. Comprehensive research requires collaboration of researchers with different background of knowledge that is normally grouped in a research group. Department of Agro-industrial Technology, one of the research units at Universitas Gadjah Mada, has 4 research groups, namely:

1. **Operations and Supply Chain Risk Management (OSCRM)**, which covers researches in the field of operation managements, risk managements, logistics, life cycle assessments, ergonomics, modeling and simulations, and traceability of agro-industrial products.
2. **Quality Improvement of Agro-industrial Products (QIAP)**, which covers researches in the field of destructive and non-destructive testing, activity-based costing, halal study, handling and processing of agro-industrial products, product developments, quality control and management systems, simulation and modeling, database of Indonesian indigenous flavor (DIFI), packaging, and traceability of agro-industrial products.
3. **Sustainable Agro-industrial Systems (SAIS)**, which covers researches in the field of bio-productions, cleaner production, eco-efficiency, life cycle assessment, renewable energy, modeling and simulation.
4. **Entrepreneurship & SMEs Development (ESDE)**, which covers researches in the field of SMEs' product development, planning and performance of HRM, marketing of agro-based products, policy and strategic planning, eco-restoration, as well as business modeling.

Laboratories

To support research activities conducted by the four research groups, the department is supported by six laboratories, namely: Industrial Systems Management Laboratory; Bio-industry Laboratory; Quality Analysis and Standardization Laboratory; System Analysis and Industrial Simulation Laboratory; Production Systems Laboratory; Product Engineering and Waste Management Laboratory.

COMMUNITY SERVICES

The Department defines community service as activities that utilize science and technology to promote the welfare of the community. The activities, especially in partner villages, have been conducted through training, application of appropriate technologies, and community empowerment. The activities have been conducted by both academic staff and students, involving local governments and international partners. Beside to the partner villages, training has also been given to the other educational institutions and agro-industrial producers. In the last 4 years, there were several community services conducted by the departments, which can be seen below.

1. Student exchange community services in Yogyakarta Special Region, a community service collaboration and partnership with Ehime University, Japan.
2. Improving lay out and sanitation condition of agro-industrial tourism areas in Kuwaru Coast, a community services collaboration with Directorate General of Higher Education.
3. Quality improvement of fresh and processed food product of SMEs in Yogyakarta Special Region, a community service collaboration with local government.
4. Supply chain management training, a training collaboration with Universitas Pembangunan Nasional Yogyakarta.
5. Assistance and rehabilitation of communities on the slopes of Merapi Mountain, a community services collaboration with local and national governments.
6. Risk management training, a training collaboration with a state-owned enterprises
7. HACCP training, a training collaboration with Politeknik Ketapang.



<http://tip.ugm.ac.id/>



A graduate in a black cap and gown, seen from the back, holding a diploma. The background is dark with some blurred lights.

GRADUATE PROGRAMS

MASTER PROGRAM

Master Program at the Faculty of Agricultural Technology Universitas Gadjah Mada is generally organized with the aim to produce graduates to be able to:

1. Have the ability to develop and update the science, technology, and/or art by mastering and understanding, approach, method, scientific principles along with their application skills
2. Have the ability to solve problems in the field of expertise through research and development activities based on scientific principles
3. Have the ability to develop their professional performance as indicated by the sharpness of the analysis of the problem, wide and comprehensive review, coherence trouble shooting or similar professions



Administrative process to conduct master program is coordinated by faculty, and academic departments organized by substantially through each program study. Master degree studies program headed by a Chairman of the Program.



Faculty of Agricultural Technology held a master level academic education in the field of science groups as follows:

1. Department of Food Technology and Agricultural Products
 - Master of Food Science and Technology
 - Master of Estate Crops Technology
2. Department of Agricultural Engineering
 - Master of Agricultural Engineering
3. Department of Agro-industrial Technology
 - Master of Agro-industrial Technology

MASTER PROGRAM OF FOOD SCIENCE AND TECHNOLOGY



In line with the development of science and technology, developments in the field of food science and technology is developing very quickly as well. In this globalization era, there is intense competition in the field of food in a variety of provision, marketing scope, as well as the security and availability of adequate nutrition. To be able to follow the progress in global competition, it must be controlled by the relevant science and technology. Thus, food science and technology education in the country has become a very important requirement. Many opportunities associated with the development of food, such as :

- Processing, especially in quality control, research and product development
- Protecting consumers to obtain products nutritious, safe and affordable prices
- Holders of regulatory authorities and legislation in the field of food and supervision

Master Study Program of Food Science and Technology, Universitas Gadjah Mada designed and implemented to achieve high effectiveness and efficiency of education. High effectiveness indicated by the latest science that the students get that refers to the progress that is happening at the global level, and efficient with an average student will be completed at the planned time. Graduates of this master program are expected to have high competence in the field of food science and technology as well as technical skills to carry out research and development. If eligible, graduates of the program can continue to pursue possible doctoral program studies (PhD) in the field of Food Science or other related field.

MASTER PROGRAM OF ESTATE CROPS TECHNOLOGY

Plantation commodities are primary non-oil foreign exchange earner for the State. And the development potential of this sector still wide-open to the real sector in Indonesia. Indonesia is a major exporter of estate crops products such as palm oil, coconut, essential oils, rubber, coffee, tea, and cocoa. However, most of these products are exported in the form of raw materials which is low value added. Foreign buyers will process the raw materials into high-value-added processed products for the purposes of the medical industry. Ironically, Indonesia imports most of the refined products. This is due to the lack of mastery of relevant technologies to enhance the added value of the estate be processed further (downstream products) and constitute a real threat to the sustainability of our national plantation industry.

Plants produce huge number of biomass commodities. The use of biomass is becoming increasingly important as a source of energy and basic materials of polymer compounds because of the lack of oil. Biomass utilization of by products and waste commodities can be done using the bio-refinery concept. Through enzymatic process, chemical and microbiological, those biomass can be converted into a fine chemical products, biofuels, biodiesel, food and feed which got a high added value.



MASTER PROGRAM OF AGRICULTURAL ENGINEERING

Agricultural Engineering is one part of the field of agricultural sciences. Sub-field of science is focused on the use of management principles and techniques in the process of biological mass production, handling and processing to fulfil human needs while maintaining the sustainability of resources and environmental sustainability. Coverage of agricultural engineering include: processing and management of land and water, planting and maintenance, harvesting, post-harvest handling, equipment and agricultural machinery, energy in agriculture, as well as environmental engineering and agricultural buildings.



Development of Master Program study of Agricultural Engineering directed towards agriculture and bio-system engineering. This development becomes imperative to make agricultural engineering becomes more deeply in science and meet the demands of stakeholders, So that there are additional bio-system material in the latest curriculum. Master program of Agricultural Engineering offers three concentration/interest, namely:

- Land and Water Resources Engineering
- Bio-mechanics and informatics
- Food Engineering and Post-harvest

MASTER PROGRAM OF AGRO-INDUSTRIAL TECHNOLOGY

Long-term development, has the direction of development to achieve balanced economic structure, namely by creating an advanced manufacturing industry and supported by the formidable power of the agricultural sector. Even in the 2005-2025 Long Term Development plan top priority in development is the development of agriculture and marine based industries. Therefore, the development of agriculture with emphasis on the development of agro-industries should be able to exploit the potential of natural resources as much as possible and its human resources, appropriately both in quantity, time and number.



Agro-industry development, directly or indirectly, will require the availability of reliable human resources, which can manage efficiently and effectively agro-industry and have high competitiveness in the global market and oriented towards consumers. It required capabilities and expertise in technology and management of agricultural industries that have special characteristics, such as raw materials is seasonal, perishable and non-uniform quality. The knowledge base is needed, especially to analyze, develop alternative and determine a solution or decision making in the agricultural industry.



Master of Agricultural Industry Technology is designed to create the human resources that have the managerial and technical capabilities that are able to reliably meet the demands of globalization. In this study program agriculture is seen as an integrated system, the chain linking farmers, suppliers, processors, distributors and retailers, each of which plays an important role. System approach in the agroindustrial development is special features for this postgraduate study program. This program also give emphasis on the development of agricultural technology in the industry, because the technology is a very important factor in the free market competition.

Targets to be achieved by this study program is generating human resources who have the ability and mastery of technology and management of agro-industry so as to improve the competitiveness of the industry, both in the local and global markets.



DOCTORAL PROGRAM

DOCTORAL PROGRAM OF FOOD SCIENCE

Food science is a science that involves the most basic human needs. Understanding, utilization and processing of biological resources in food need improvement to meet the needs of the present and anticipate future needs. All of it was organized with the help of science and environmentally friendly technologies and ensure diversity.

To meet the needs of qualified human resources doctorate in the field of food science for educational purposes, research, and industry starting in the 1999/2000 graduate school UGM opens doctoral education program in Food Science Program, but now its management has been taken over by the Faculty of Agricultural Technology. Study Program of Food Science was established with the aim to produce graduates (PhD) who are competent in developing the concept of food science through relevant research managed by the Faculty of Agricultural Technology.



DOCTORAL PROGRAM OF AGRICULTURAL ENGINEERING SCIENCE



Agricultural Engineering Science is the science that studied and developed in the field of agriculture. The field is focused on the use of the principles of engineering and technology in the production process of biological age, as well as business management that is able to create a sustainable competitive advantage (sustainability).

Agricultural Engineering Study Doctoral Program is an academic path way program as a continuation of other relevant Graduate Program. Doctoral Program of Agricultural Engineering offers four programs of interest, namely:

- Science and Land Resources and Water Engineering
- Science and Engineering Bio-Mechanics and Informatics
- Science and Food Engineering and Post-harvest
- Science and Technology Industrial Agriculture





SUPPORTING UNITS



LIBRARY

Library of the Faculty of Agricultural Technology is located on the fourth floor of the new building. Textbooks, essay (print/CD); thesis and dissertation ; research report; national journal / magazine; international journal and other reference of learning processes available in the library of the Faculty of Agricultural Technology.



Library using open access system to serve the needs of students and other visitors. This system gives the user flexibility to the library to choose and take their own desired collections. To facilitate the visitors to find the information or a collection, the library provides tracking system (OPAC / catalog online). With the online catalog , the collections can be searched by the author, title and subject.

The visitors can also access databases subscribed by the Library UGM such as Science Direct, ACS Publications, Proquest, Scopus, Wiley Online-eBooks and others by using the computers that available in the library. For those who bring their own laptop in the library has also been provided wi-fi.



Quality Management Unit

Quality Management Unit (UMM) is a unit to guarantee and ensure that policies, plans and academic ideals contained in Academic Document (Policies, Standards and Regulations Academic). Quality Management Unit FTP - UGM (UMM FTP UGM) was formed on December 17th 2008 in accordance with the Dean's decree number 2284/FTP-UGM/PP/2008.

Quality Management Unit run by the academic quality assurance organization headed by a Quality Management Representative (QMR) that responsible to the Vice Dean of Academic and Student Affairs.

Faculty of Agricultural Technology UGM has been successful, certified ISO 9001: 2008 for the Bachelor Degree since 2008. As for the level of Master Degree and Doctoral Degree successfully certified ISO 9001: 2008 in December 2009 from SGS Certification Agency until now.



Agricultural Technology Career Center

Alumni and Career Development Unit of the Faculty of Agricultural Technology (ATCC / Agricultural Technology Career Center) is a unit under the Vice Dean of Alumni Affairs, Cooperation and Business Development. This unit is expected to participate in improving the skills of new graduates (fresh graduates) in entering the labor market as well as to establish communication between faculty and alumni, especially in terms of faculty development in general and self-development and competence of alumni through educational programs that lead to life-long education (lifelong education programs).



Services provided by ATCC consist of career information (job information, information internships and scholarship information), the alumni services (notarized document), self-development programs (counseling and training), services for companies (recruitment).

AGRITECH : Journal of Agricultural Technology

AGRITECH is a scientific journal that publishes research results in the field of food technology and agriculture, agriculture and bio-system engineering, agriculture and industrial technology. The manuscript that published, has been reviewed by experts in their fields (peer-reviewed) from various institutions in Indonesia. AGRITECH has been accredited by Directorate of Higher Education (No. 56/DIKTI/Kep/2012).



AGRITECH published by the Faculty of Agricultural Technology, Universitas Gadjah Mada The Journal is published four times a year in February, May, August and November.

Testing Laboratory

Testing Laboratory Faculty of Agricultural Technology UGM is a unit under the Vice Dean for Alumni, Cooperation and Business Development. This unit is the main organization of laboratory testing / public service in the Faculty of Agricultural Technology.

Currently the Testing Laboratory FTP UGM is added scope of the testing laboratory accredited to ISO 17025: 2005 for proximate analysis.

Testing Laboratory Faculty of Agricultural Technology UGM accredited ISO 17025:2005 by KAN (Komite Akreditasi Nasional since August 2014 (Accreditation Number LP-764-IDN). Scope of Testing Laboratory FTP UGM that has been accredited by KAN are drying machine for post-harvest laboratory ; aflatoxin analysis for Mycotoxin Laboratory.



Information and Communication Technology Unit

TIK is a unit to support the implementation of information systems and learning processes at the Faculty of Agricultural Technology UGM.

Information and Communication Technology has the function:

- a. As a network administrator
TIK responsible for managing the distribution of internet access to the academicians of the Faculty of Agricultural Technology, via a cable (wired) or wireless (wireless) as well as computer servers that support the operational activities of the above.
- b. As an application manager
The application made by UGM (center) or the application made by the Faculty itself (TIK), such as:
 - Back Office AIS (Academic Information System)
 - SMS Gateway (<http://www.sms.tp.ugm.ac.id>)
 - Class Attendance Recap System
 - Paperless Office System
 - VOIP (Voice Over Internet Protocol) Telephone
 - Faculty Website (<http://www.tp.ugm.ac.id>)
 - University Email and Hosting (<http://mail.ugm.ac.id/wmail>)
- c. As a technician
To improve and manage hardware owned by faculty as computers, LCD projector, voip phone and other IT devices.
- d. As a computer consulting center.



Agroindustry Incubator Unit

Agroindustry Incubator is a unit for study participants (students, alumni, community, etc.) to improve the knowledge and skills to address the issues in the community through academic approach that simultaneously encourage the formation of a true entrepreneur beings capable to create new job. Vision of Agroindustry Incubator Unit FTP UGM is to be a resource center, applied research and development center, a training center for scored entrepreneurs and central resilient agro-industry consulting services that support the achievement of the Universitas Gadjah Mada as a World Class Research University.



Some of the activities carried out in the Incubator is entrepreneurship training, training manufacture of food products, training appreciation packaging of processed products (Horticulture), etc.

Student Activities



Faculty of Agricultural Technology UGM student activities are an integral part of the development and dissemination of science, technology and the arts to improve people's lives and enrich the national culture.

Some of the activities of students in FTP UGM:

1. Student Executive Board (BEM)
2. Student Senate
3. Student Family Food Technology and Agricultural Products (KMTPHP)
4. Students Association of Agricultural Engineering (PERMATETA)
5. Agricultural Industry Technology Student Association (HIMATIPA)
6. Mountaineering Club (GITAPALA)
7. Agritech Study Club (ASC)
8. Media Information Science and Agricultural Technology (AGRITA)
9. Religious Activities
 - a. Muslim Student Association of Agricultural Technology (KMMTP)
 - b. Catholic Student Association (SGA)
 - c. Christian Student Fellowship (FMD)
10. Sport Activities
 - a. Tractor Football Club (FC Tractor)
 - b. Agritech Badminton Club (ABC)
 - c. Basketball club (Agritech Ballers)
 - d. Volleyball club (Vortech)
11. Art Society of Agricultural Technology
12. Student Choir

Contact us :

Faculty of Agricultural Technology, Universitas Gadjah Mada

Jalan Flora No. 1, Bulaksumur, Yogyakarta, 55281 – Indonesia
Phone: (62) 274 – 901320, 589797, 551220 Fax: (62) 274 – 589797
E-mail: fateta@ugm.ac.id, dekan-tp@ugm.ac.id, wd4.tp@ugm.ac.id
Website: <http://tp.ugm.ac.id>
Attn: **Prof. Dr. Lilik Sutiarmo** (Dean)
or **Dr. Wahyu Supartono** (Vice Dean for Alumni, Collaboration and Business Development)

Department of Food and Agricultural Product Technology

Faculty of Agricultural Technology, Universitas Gadjah Mada (UGM)
Jalan Flora No 1, Bulaksumur, Yogyakarta 55281 – Indonesia
Phone and Fax: (+62)274- 544716
E-mail: fateta@ugm.ac.id
Website: <http://tphp.ugm.ac.id>

Department of Agricultural Engineering

Faculty of Agricultural Technology, Universitas Gadjah Mada (UGM)
Jalan Flora No 1, Bulaksumur, Yogyakarta 55281 – Indonesia
Phone and Fax: (+62)274-563542
E-mail: tep_ftp@ugm.ac.id
Website: <http://tep.tp.ugm.ac.id>
Attn: **Prof. BambangPurwantana**

Department of Agro-Industrial Technology

Faculty of Agricultural Technology, Universitas Gadjah Mada (UGM)
Jalan Flora No 1, Bulaksumur, Yogyakarta 55281 – Indonesia
Phone and Fax: (+62)274-551219
E-mail: mirwan@tip-ugm.org
Website: <http://tip.ugm.ac.id>

