

生物產業機電工程學系

教育目標

生物產業其範圍包括傳統農林漁牧業之生產、自動化、品質檢測等及新興發展之生物產業如環保、生醫、生物材料、生物檢測等多方領域。因此本系教學目標為培養國家社會發展生物產業所需之各類工程人才。

課程規劃

本系設有大學部與碩、博士班，其學術與專業技能是以機械工程為基礎，結合電子、資訊、機電整合、自動化等工程技術與農業、生物基礎知識，應用於生物、農業等相關產業上。

主要研究領域

本系研究領域是以整合工程技術應用於農業與生物產業，除延續具有豐富成果的農業自動化、E化領域外，並因應生物產業的發展，逐步擴展仿生工程、感測與生物晶片、生物資訊、生醫工程等科技領域。

- ◆生物產業自動化工程
- ◆生物產業電子化工程
- ◆生物系統工程
- ◆農業生物技術之發展
- ◆生物產業機械之研究發展
- ◆高科技在農業及生物工程上之應用研究
- ◆生物感測器及生物晶片之研發
- ◆生物材料加工工程
- ◆生物廢棄物處理工程
- ◆水產養殖工程
- ◆畜牧生產及加工工程
- ◆生物環境控制工程
- ◆生物與奈米、微機電等科技之結合研究

教研成果

本系每年與各相關機構(如農委會、科技部及其他單位等)合作計畫，計畫補助經費約4千萬元。發表多篇論文、申請獲得國內外各項專利與技術移轉。

本系積極培養生物產業所需之各類工程人才，保持與產業的交流與引進新科技與技術，適時的融入課程規劃與發展。並因應生物產業新領域的形成，應積極尋求人才，例如農機設計與試驗、生醫工程、感測與生物晶片、生物產業生產加工工程等

領域。不定期舉辦相關研討會探討從農業工程到生物產業之發展定位與趨勢，以因應科技與產業之快速變動。以提升國際化之程度，拓展與國外學研相關機構之合作。加強系友聯絡，定期辦理相關活動，強化系友會之組織及服務功能。



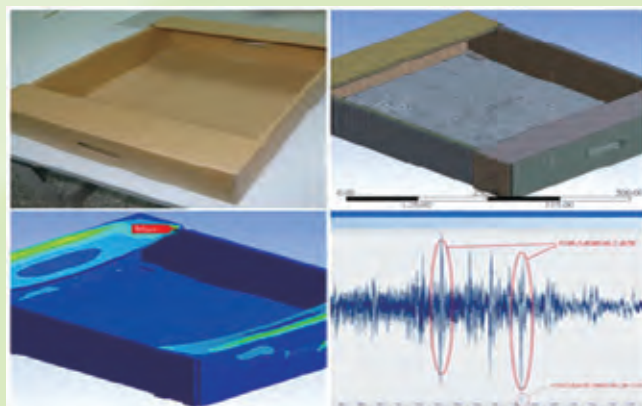
▲稻穀儲量估測系統
Measurement system for rice



▲臺中市大里區農會穀倉進行穀堆體積估算試驗
Marked tiers of measured points on Tali Granary



◀▲手持式倍力缸推進系統組合實體圖
Diagram of handheld force cylinder type propulsion system



▲瓦楞紙製蛋箱
A paper type container for eggs

Mission

The department focuses on training students to acquire specialized skills and knowledge in the integrated engineering foundation for the bioindustry.

Curriculum

The department offers the degrees of the Bachelor of Engineering (BE), Master of Engineering (ME), and Doctor of Philosophy (Ph. D.) in bioindustrial mechatronics engineering. The core curriculum requires full knowledge in using mechanical engineering, electronics, information technology, mechatronics, and automation engineering principles for biological and related agricultural sciences.

Core Research Topics

- ◆ Automation Engineering in Bioindustries.
- ◆ Electronic Engineering in Bioindustries.
- ◆ Biosystems Engineering.
- ◆ Development of Agricultural Biotechnology.
- ◆ Research and Development of Bioindustrial Mechatronics Engineering.
- ◆ Application and Research of Advanced Technology on Agriculture and Bioengineering.
- ◆ Research of Biosensors and Biochips.
- ◆ Biomaterials Processing Engineering.
- ◆ Biowaste Treatment Engineering.
- ◆ Aquacultural Engineering.
- ◆ Animal Production and Processing Engineering.
- ◆ Bioenvironmental Control Engineering.
- ◆ Research of Combined Biotechnology, Nanotechnology, and Microelectromechanical Systems.

Achievements

The department receives research funds of approximately NT\$40 million per year from different sources, including COA, MOST, private firms, and other institutions. Numerous research articles and patent licenses have been published and obtained, and most research results and new techniques have also been transferred to related industries.

Students are trained not only to be engineers in several areas of the bioindustry, but are also taught to maintain contact with the industries for introducing novel technologies, and then use the responses to modify the curriculum.

Moreover, to enhance the knowledge required in the new bioindustry, we actively seek professionals in the areas of design and testing of farm machinery, biomedical engineering, biosensing and biochips, and processing engineering of biomaterials. The department holds a conference and seminar on the development and trend of agricultural engineering to bioindustrial engineering. The extension to international cooperation with research institutes abroad to promote the degree of internationalization is provided by the department. Finally, because of our efficient alumni association, our alumni act as great role models for current students, and the department receives benefits from their skills and experiences.



▲ 批次式微藻培養條件試驗
Batch cultural for upscaling of microalgae



▲ 自動化微藻培養反應器（平直式葉片攪拌翼）
Automatic bioreactor with flat-blade type impeller for microalgae cultivation



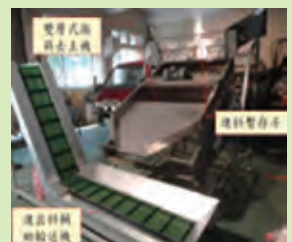
▲ 太陽能數位化控制LED燈系統
Solar cell LED light system with digital control to set the planting conditions



▲ 多功能除溼乾燥機
Multiple functions of dehumidified dryer



▲ 蓖麻果實收穫雛型機
Proto-type harvesting machine of castor oil plant



▲ 落花生鮮莢果去土系統
Soil removing system of peanut pod