ACADEMIC PROGRAMS OF ASSUMPTION UNIVERSITY

Bachelor Degree Programs (4 years)

Faculty of Architecture (Degree: Bachelor of Architecture – B.Arch)
  - Architecture
  - Interior Architecture

Faculty of Arts (Degree: Bachelor of Arts – BA)
  - Business English
  - Business French
  - Business Chinese
  - Business Japanese
  - Music Business
  - Contemporary Music Performance
  - Professional Music
  - Contemporary Music Writing and Production

Faculty of Biotechnology (Degree: Bachelor of Science – BS)
  - Food Technology
  - Agro-Industry

Faculty of Communication Arts (Degree: Bachelor of Arts – BA)
  - Communication Arts – Advertising / New Media Communication / Performance Communication / Public Relations
  - Visual Communication Arts

Faculty of Engineering (Degree: Bachelor of Engineering – B.Eng.)
  - Electrical and Electronics Engineering
  - Computer and Network Engineering
  - Telecommunications and Electronics Engineering

Faculty of Law (Degree: Bachelor of Law – LL.B.)
  - Business Law

Faculty of Management (Degree: Bachelor of Business Administration – BBA)
  - Marketing
  - Management
  - Finance and Banking
  - Accounting
  - Business Information Systems
  - Integrated Marketing Communications
  - Hospitality and Tourism Management
  - International Business Management
  - Property Valuation Management
  - (Degree: Bachelor of Economics – BEcon)
    - Business Economics

Faculty of Nursing Science (Degree: Bachelor of Nursing Science – BNS)
  - Nursing Science

Faculty of Risk Management and Industrial Services (Degree: Bachelor of Business Administration – BBA)
  - Property and Casualty Insurance
  - Life Assurance
  - Industrial Management
  - Real Estate

Faculty of Science and Technology (Degree: Bachelor of Science – BS)
  - Computer Science
  - Information Technology
  - Telecommunication Science
  - Applied Statistics
  - Technology Management

(Continued on inside back cover)
Preface

Being an institute of higher learning, and the first international university in Thailand, Assumption University has a definite policy to provide quality instruction to the students, both undergraduates and graduates, and both Thai and foreign nationals. An equally important function of the University is to conduct research in all fields.

Assumption University is one of the leading universities in the field of science and technology. During the past year, several of our faculty members participated in various international meetings held in Thailand and abroad; many have also presented their papers at these meetings. The Management of Assumption University is proud of their performance and achievements.

To display and maintain a record of their endeavors and achievements, and to encourage other faculty members to make similar contributions, all abstracts of scientific papers presented at the international scientific meetings during this one-year period from July 2008 to June 2009, have been compiled and published for distribution to interested individuals and institutions. The present publication is the eleventh issue of the series of the AU Abstracts, published annually. The first one, ‘AU Abstracts - 1999’ was published in September 1999, covering the presentation period from May 1998 to June 1999. Subsequent publications of the series were published in July covering a period from July of the previous year to June of the next year.

Originally, the Office of the AU Journal of Technology who initiated this publication, was charged with the responsibility to cover the activities of five ‘technology based’ faculties and schools, namely: School of Architecture, Faculty of Biotechnology, Faculty of Engineering, Faculty of Nursing Science, and Faculty of Science and Technology. As a few other faculties and schools also presented a number of ‘technological’ papers, they too are included in this publication.

It is hoped that this small publication would be of some benefit to our readers and that it will serve a dual purpose, relaying information, as well as an encouragement to all the faculty members of the ‘technology based’ faculties and schools. It is our desire to continue to present this particular series and publication every year.

On behalf of Assumption University, I wish to express my sincere thanks to Dr. Narong Chomchalow, Editor of the AU Journal of Technology, for his initiative, as well as hard work in compiling, overseeing, and preparing the manuscripts of the AU Abstracts - 2009. I also wish to thank Dr. Dobri Atanassov Batovski, Deputy Editor of the AU Journal of Technology, who assisted in editing the abstracts of this publication.

Dr. Bancha Saenghiran, FSG
President, Assumption University
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The Study of Biosurfactant as a Cleaning Agent for Insecticide Residue in Leafy Vegetable

Churdchai Cheowtirakul and Nguyen Dieu Linh*

Faculty of Biotechnology, Assumption University

Pesticides are used as the main tool for agricultural pest control. Many pesticides are, however, toxic substances and persistent in character. Concern over the pesticide residues in fruits and vegetables has led to the development of many clean up and analysis methods.

Biosurfactant was used in this study to explore the possible potential for cleaning up cypermethrin residue. Lettuce was chose as a representative for leafy vegetable. Amounts of biosurfactant and the contact times needed to reduce cypermethrin residue in lettuce to below maximum residue limit of 2 ppm to make it safe for consumers were determined. Salt, vinegar and potassium permanganate were also tested for comparing the cypermethrin neutralizing effect on lettuce with biosurfactant. A simple method to determine cypermethrin residue was developed, based on ninhydrin test which is the reaction of ninhydrin reagent with free nitrogen to form a color product which can be detected by spectrophotometer.

With the initial pesticide concentration of 100 ppm the amount of biosurfactant that needs to be used was 10 ppm of biosurfactant for 25 min, 15 ppm of biosurfactant for 15 min and 20 ppm of biosurfactant for 5 min. With the initial pesticide concentration of 10 ppm the amount of biosurfactant that needs to be used was 2 ppm for 3 min, 3 ppm for 3 min, and 4 ppm for 1 min. Adding KMnO$_4$ together with biosurfactant caused the synergistic effect that would further enhance the efficiency of this cleaning method. From this study it was concluded that biosurfactant could be used as an effective agent to clean up pesticide similar to the group of cypermethrin on leafy vegetables.

Keywords: Pesticide residues, toxic substances, cypermethrin, lettuce, ninhydrin test, synergistic effect.


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* A candidate from Ho Chi Minh City, Vietnam, applying for a Fulbright scholarship.
Faculty of Engineering

21st Inter-University Conference of the Association of Southeast Asian Institutions of Higher Learning – Thailand (ASAIHL – Thailand), Theme: University Autonomy
Meeting Room Phraya Sri Wisarnwaja, Office of the University, Chiang Mai University, Chiang Mai, Thailand, 17 October 2008

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The International Association of Science and Technology for Development (ILASTED) International Conference on Parallel and Distributed Computing and Networks (PDCN 2009)
Innsbruck, Austria, 17–18 February 2009

2. Permuting Ability of Uniaxial 2D and 3D Tori under Dimension-Order Routing
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Some Distinctive Features of Engineering Education in Russia Compared to Thailand and Other Countries

Gennady Veselovsky
Faculty of Engineering, Assumption University

This paper considers some distinctive characteristics of the Russian system of higher education in engineering. Examples of such outstanding contributions include aircraft engineering, space technology and high performance computing. These achievements are the result of the Russian efficiency in training engineers. One salient aspect of the Russian system is its strong emphasis on fundamental subjects – e.g. mathematics and physics – and the compulsory apprenticeship in the best companies beginning in the third year of studies. The Russian system is unique compared to other universities. All exams are oral, there are no mid-term exams, only final ones. The curriculum is fixed and must be followed in strict sequence. At present, Russia is in the process of reforming its higher education system. This reform involves the transition from one-level certifying system involving a diploma, to a two-level certifying system involving a Bachelor’s and Master’s degrees. This is to allow its programs to be recognized globally. It also involves the establishment of a “federal system” which would include the most prestigious universities. These “federal universities” are entitled to larger funding from the state budget and greater autonomy than other universities. This paper conducts a comparative analysis for the Electrical Engineering (EE) and Computer Engineering (CE) offered at various institutes in different countries (including Assumption University of Thailand and Asian University). It has been found that, compared to other universities, what is distinctive about Assumption University is its relatively low number of fundamental courses and a high number of professional courses. This study employs the $k$-parameter method recommended by UNESCO.

**Keywords:** Engineering education, Russian system, effectiveness, emphasis on the fundamentals, $k$-parameter method.

**Presented at:** 21st Inter-University Conference of the Association of Southeast Asian Institutions of Higher Learning – Thailand (ASAIHL – Thailand), Theme: University Autonomy, Meeting Room Phraya Sri Wisarnwaja, Office of the University, Chiang Mai University, Chiang Mai, Thailand, 17 October 2008.

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**Full paper requisition:** <gveselovsky@au.edu>
Permuting Ability of Uniaxial 2D and 3D Tori under Dimension-Order Routing

Gennady Veselovsky
Faculty of Engineering, Assumption University

Permutations belong to communications patterns demanded frequently in massively-parallel computers especially of the SIMD type. A permutation is said “admissible” to a given interconnection network if it does not cause blockings in that network under a chosen routing algorithm. Determining the admissibility of a given permutation to various static connecting topologies is a fundamental problem. Based on congruence notion from number theory, this paper presents a simple method which solves admissibility problem for regular permutations to uniaxial 2D and 3D tori under deterministic dimension-order routing commonly used in practice. Here “uniaxial” means that in every routing step all data items participating in a permutation can move along the same axis only. It is assumed that all nodes of a system work in a synchronous fashion what is also characteristic to SIMDs. The efficiency of the method is illustrated by the examples with determining admissibility of some frequently used in parallel programming permutations which belong either to Omega or BPC (bit-permute-complement) classes.

Keywords: Interconnection network, torus, dimension-order routing, permutation admissibility.

Presented at: The International Association of Science and Technology for Development (IASTED) International Conference on Parallel and Distributed Computing and Networks (PDCN 2009), Innsbruck, Austria, 17-18 February 2009.

Published in: Proc. PDCN 2009.

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1. Providing the eLearning Services for the Blog

*Ridwan Sanjaya and Saranphong Pramsane*
Providing the eLearning Services for the Blog

Ridwan Sanjaya* and Saranphong Pramsane

Graduate School of Information Technology, Assumption University

Nowadays, Weblog or Blog is common to the people in the world, including those who work in the education field. People use it because of the easiness. Some lecturers use it to share their class meeting material to their students. Others use it to share their documents or presentations of research and workshop. They also can upload the multimedia contents to the Blog to describe the knowledge in more detail. However, the Blog features are not the same with the Learning Management System (LMS) features. The LMS software usually provides the facility to do the eLearning activities, such as giving a quiz to the students, sending the assignments to the lecturers, and grading the assignments. Blog does not provide those eLearning features. It needs additional elements/widget provider to provide the eLearning facilities. By combining the eLearning widgets from several providers to the Blog, people should get the benefits from the easiness of using the Blog and easiness of providing eLearning activities.

Presently, there is no widget provider who is really supporting eLearning activities to their Blogs. Users have to combine several widgets from different providers to give all the eLearning services in their Blog. This paper explains the technical side to provide the eLearning supports for the Blog. The design of those supports should offer the facility to upload a course material, creating a quiz or an assignment, sending the answer, and grading the assignments. However, it must not change the characters of Blog which is easy to use by everyone.

Keywords: Learning Management System, widget provider, weblog, grading, upload, easiness.


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Office of the President
Office of the President

The First Indian National Vetiver Workshop on, “Vetiver System for Environmental Protection and Natural Disaster Management”
Hotel Sarovaram, Cochin, Kerala, India, 21-23 February 2008*

1. Other Uses, and Utilization of Vetiver
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* Since both papers have not been included in AU Abstracts 2008, they are presented in this volume of the AU Abstracts even though the date of presentation is not the specified period of 1 July 2008 to 30 June 2009.
Other Uses, and Utilization of Vetiver

Narong Chomchalow*

Office of the AU Journal of Technology, Assumption University

In addition to being conventionally used to perform specific functions in soil and water conservation, environmental protection, disaster mitigation, slope stabilization, erosion control, absorption of heavy metals, wastewater treatment, etc., vetiver plant has also several other non-conventional uses, e.g. as forages, ornamentals (landscaping and decorative potted plants), dust and heat reduction, windbreak, insect trap, field / plot boundaries and wincing the car out from the ditch.

Harvested (fresh, partly dried or dried) vetiver leaves, culms and roots are utilized, mostly after some degree of processing, in various ways such as: input of agriculture-related activities including mulch, compost, nursery block / planting medium, fodder, mushroom cultivation, livestock bedding, rope to tie rice bundle, botanical pesticides and allelopathy; input of construction-related activities including roof thatch, hut, mud bricks, prefabricated vetiver-clay blocks, vetiver-clay composite storage bin, particle board and panel, veneer and fiber board, straw bale, bale building, and cement replacement material (artificial pozzalans and ash for concrete work); handicrafts and art works including handy accessories, containers, decorative materials, home appliances, souvenirs and other objects; medicinal applications including traditional medicines and herbal drinks; perfumes and fragrances including perfumery, aromatherapy, flavor and potpourri; bouquets (fresh and dried); energy sources including ethanol and green fuel; industrial products including pulp/paper and panel; coolants including blinds or tatti, house mats, woven screens, hand fans, broom hangers, baskets, cabins, car rooftop mats; mattress and other stuffing.

This paper also discusses: (i) the main objective of growing vetiver, (ii) the growing of vetiver as a cash crop for utilization, (iii) the ecological benefit of growing vetiver, and (iv) botanical pesticides from vetiver.

Keywords: Forage, fodder, mulch, compost, mushroom cultivation, botanical pesticides, ornamentals, handicrafts, traditional medicines, perfumery, aromatherapy, pulp/paper, panel, energy sources, coolants.


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The Thailand Vetiver Network

Narong Chomchalow*

Office of the AU Journal of Technology, Assumption University

The vetiver activities in Thailand started from the work initiated by His Majesty King Bhumibol Adulyadej. From 1991, His Majesty conducted his own experiments and also advised the staff of the Royal Development Study Centers, the royal project’s stations, and various institutions which he visited to do experiments on vetiver for the purpose of soil and water conservation. Realizing the fact that vetiver is most effective for soil erosion control, various institutions began to implement this technology. The Office of the Royal Development Projects Board (ORDPB) established the Thai Vetiver Network (THVN) in 1997 to coordinate the activities on vetiver conducted by around 40 agencies. The main objectives are to (i) collect information regarding vetiver research and development in Thailand, (ii) provide information on the application of vetiver system in Thailand to interested persons and organizations, both in Thailand and abroad, (iii) coordinate activities with other vetiver networks, and (iv) disseminate the information on vetiver, especially works conducted in Thailand in the form of electronic database and websites.

The members of THVN are all governmental and non-governmental organizations involved in the implementation of vetiver projects as well as the use and utilization of vetiver in Thailand. The secretariat office of THVN is located at ORDPB with a few part time staff. It is supported by the Committee for Scientific, Evaluation and Monitoring of the Vetiver Promotion Program of ORDPB. All operational costs of THVN are met by the government budget allocated to ORDPB. The activities of THVN include: (i) the publication of a quarterly Thai-language newsletter, Bhumivarin Anurak; (ii) the publication of technical bulletins in Thai language; so far three have been published; (iii) the publication of technical manuals on vetiver; so far, about ten have been published; (iv) organization of training courses on the techniques of planting vetiver and vetiver handicraft making, both nationally and internationally, and domestically and abroad; so far, about ten courses have been conducted; (v) technical supports to other countries, including sending experts to save Madagascar’s FCE Railway, providing experts to train Myanmar scientists on the vetiver system, providing plant materials to neighboring countries such as Myanmar, Lao PDR, Vietnam, Cambodia; and (vi) setting up a website (http://thvn.rdpb.go.th) to provide useful information about THVN in Thai and English.

Keywords: Vetiver system, ORDPB, technical bulletins, Bhumivarin Anurak, training, plant materials, handicraft making, website.


Published in:
<www.vetiver.org/TVN_INDIA_1stWORKSHOP_PROCEEDINGS/0-Contentsa.htm>

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1. A Subjective Scheduler Based on Neural Network for Scheduling Vehicles in a Four-Junction Traffic System
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2. An Improved Technique for Retraining Neural Networks In Adaptive Environment
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International Conference on Information and Communication Technologies (ICICT)
Hong Kong, 23-25 March 2009

3. Using the Students-as-Customers Concept in Technology Disciplines: Students’ Perspectives
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The 6th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON 2009)
Phatthaya, Chon Buri, Thailand, 6-9 May 2009

4. An Incremental Learning Algorithm for Supervised Neural Network with Contour Preserving Classification
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A Subjective Scheduler Based on Neural Network for Scheduling Vehicles in a Four-Junction Traffic System

Kothalil Gopalakrishnan Anilkumar and Thitipong Tanprasert

Faculty of Science and Technology, Assumption University

This paper presents a Backpropagation Neural Network (BPNN) based subjective scheduler which schedules vehicles in a proposed four-junction traffic system. The scheduler is a hybrid structure of a 3-layer BPNN and a greedy vehicle alignment procedure. The BPNN is properly trained with an initial dataset which is generated on the basis of a given subjective criteria. The BPNN detects priorities of each vehicle based on their attributes. The alignment procedure selects a vehicle from each junction node at a time based on their priorities. Then concurrently allows each vehicle to flow into the system in order to minimize the overall clearing time of vehicles without violating the node constraints. At the same time, the scheduler checks whether there are any route conflicts between vehicles. In case of a route conflict between vehicles is detected then the scheduler prevents their concurrent flow and allows them to flow consecutively. The proposed cost evaluation indicates that the performance of the scheduler is reasonable.

Keywords: Backpropagation algorithm; greedy alignment procedure; subjective criteria; priority; route generation.


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An Improved Technique for Retraining Neural Networks in Adaptive Environment

Thitipong Tanprasert, Piyabute Fuangkhon and Chularat Tanprasert*

Faculty of Science and Technology, Assumption University

This paper presents an improved version of the Decay Prior Sampling (DPS) technique for controlling the aging rate of knowledge learned by a multi-layered perceptron type neural network as the network is progressively retrained to handling a new set of training samples in an adaptive environment, in which the new training samples may or may not conform with the learning context of the previous training session. This technique applied the concept of outpost vectors, which loosely define the territory between classes, to represent the domain of previously learned knowledge. The test results confirm the improvement over the original technique that uses only subtracting clustering for modeling such a domain.

Keywords: Decay Prior Sampling technique, adaptive learning, incremental learning, multi-layered perceptron


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* Knowledge Elicitation and Archiving Laboratory, National Electronics and Computer Technology Center, Thailand Science Park, Pathum Thani, Thailand.
An Incremental Learning Algorithm for Supervised Neural Network with Contour Preserving Classification

Piyabute Fuangkhon and Thitipong Tanprasert
Faculty of Science and Technology, Assumption University

This paper presents an alternative algorithm for integrating the existing knowledge of a supervised learning neural network with the new training data. The algorithm allows the existing knowledge to age out in slow rate as a neural network is gradually retrained with consecutive sets of new samples, resembling the change of application locality under a consistent environment. The algorithm also utilizes the contour preserving classification algorithm to increase the accuracy of classification. The experiment is performed on 2-dimension partition problem and the result convincingly confirms the effectiveness of the algorithm.

Keywords: Integrating the existing knowledge, consistent environment, accuracy of classification, 2-dimension partition problem.


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Using the Students-as-Customers Concept in Technology Disciplines: Students’ Perspectives

Boonlert Watjatrakul

Faculty of Science and Technology, Assumption University

Educational institutions increasingly adopt the students-as-customers concept to satisfy their students. Understanding students’ perspectives on the use of this business concept in educational institutions is necessary for the institutions to effectively align these perspectives with their management practice. The study investigates whether students in technology and business disciplines have significantly different attitudes toward using the students-as-customers concept in educational institutions and explores the impact of treating students as customers in technology disciplines under students’ perspectives. The results from quantitative and qualitative data analyses show that technology students, in contrast to business students, fairly disagree with educational institutions to treat students as customers. Treating students as customers in technology disciplines will have a negative influence on teaching performance, instructor-student relationships and educational institutions’ aim, but a positive influence on service quality in educational institutions. The paper discusses the findings and concludes with implications and limitations of the study.

Keywords: Education, information technology, students-as-customers, technology disciplines.


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Master Degree Programs: (2 years)

Faculty of Biotechnology
✦ Master of Science in Food Biotechnology - MSFBT

Faculty of Science and Technology
✦ Master of Science in Computer Science – MSCS
✦ Master of Science in Telecommunications Science – MSTS
✦ Master of Science in Telecommunication and Computer Network Engineering – MScTeCNE (Joint program with South Bank University, London, UK)
✦ Master of Science in Information Technology – MSIT
✦ Master of Science in Technology Management – MStecM
✦ Master of Science in Internet and Multimedia Engineering – MScIME

Graduate School of Arts
✦ Master of Arts in Philosophy – MAPh
✦ Master of Arts in Religious Studies – MARS
✦ Master of Arts in Teaching English as a Second Language – MATESL
✦ Master of Arts in Teacher Education – MATE?

Graduate School of Business
✦ Master of Business Administration – MBA
✦ Master of Science in International Business – MScIB
✦ Master of Science in Financial Management – MScFM
✦ Master of Management in Organization Management – MM
✦ Master of Science in Human Resources – MScHR

Graduate School of Computer Information Systems
✦ Master of Science in Computer Information Systems – MSCIS

Graduate School of Computer and Engineering Management
✦ Master of Science in Computer and Engineering Management – MSCEM

Graduate School of Counseling Psychology
✦ Master of Science in Counseling Psychology – MSCP

Graduate School of Education
✦ Master of Education in Curriculum and Instruction – MEd
✦ Master of Education in Educational Administration – MEd

Graduate School of Engineering
✦ Master of Engineering in Broadband Telecommunications – MEng
✦ Master of Engineering in Power Electronics – MEng
✦ Master of Science in Telecommunications Management – MSTM

Graduate School of English Language Teaching
✦ Master of Arts in English Language Teaching – MAELT

Graduate School of Internet and E-Commerce Technology
✦ Master of Science in Internet and E-Commerce Technology – MSIEC

Graduate School of Philosophy and Religious Studies
✦ Master of Arts (Philosophy) – MA (Philosophy)
✦ Master of Arts (Religious Studies) – MA (Religious Studies)

Graduate School of Tourism Management
✦ Master of Arts in Tourism Management – MATRM

Doctoral Degree Programs
✦ Doctor of Philosophy in Computer Information Systems – PhDCIS
✦ Doctor of Philosophy in Computer Science – PhDCS
✦ Doctor of Philosophy in Computer and Engineering Management – PhDCEM
✦ Doctor of Philosophy in Food Biotechnology – PhDFBT
✦ Doctor of Philosophy in Information Technology – PhDIT
✦ Doctor of Philosophy in Philosophy – PhDPhil
✦ Doctor of Philosophy in Telecommunications and Computer Network Engineering – PhD TeCNE
Assumption University of Thailand

Motto: Labor Omnia Vincit

Philosophy:
In loyalty to its Christian mission, Assumption University stands for:

- the inculcation of respect for the three institutions of the Nation: Religion, Country, the King and a democratic way of life.
- the belief that a man justifies himself and his existence by the nobility of his work.
- the commitment to be a light that leads men towards the true source of all knowledge and life.

Accreditation:
The University is fully accredited by the Ministry of University Affairs. Its graduates enjoy the privileges accorded to State University graduates. Its academic standards are accepted by the Civil Service Commission of Thailand. Assumption University is recognized in the USA and other countries and the transfer of credits from the University are accepted abroad. Graduates from the University can pursue advanced degrees anywhere in the world. Assumption University is listed in the Handbook of Universities and other Institutions of the International Association Of Universities in Paris, France.

The University is recognized by:

- The Association of Christian Universities and Colleges in Asia (ACUCA)
- The Association of Southeast Asian Institutions of Higher Learning (ASAIHL)
- The International Federation of Catholic Universities (IFCU).

Objectives and Policies:
Assumption University exists for the main purpose of serving the nation by providing scientific and humanistic knowledge, particularly in the fields of business education and management science through research and interdisciplinary approaches. To this end it aims at forming intellectual competent graduates who:

- are morally sound, committed to acting justly, and open to further growth.
- appreciate freedom of expression, imbibe right attitudes and ideologies through a careful integrated curriculum of Ethics, Science, Languages and Business Management.
- achieve academic excellence through hard work, critical thinking, and effective decision-making.