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AUSTRALIA ECU EDITH COWAN UNIVERSITY

10th International Symposium on Ambient Intelligence and Embedded Systems

TECHNOLOGICAL EDUCATIONAL INSTITUTE OF CRETE

22 to 24 September, 2011
Chania, Crete, Greece

AmiEs-2011

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ACE and ISPS –
An Innovative Approach to Promoting International Student Exchange Programs

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Key Questions today

- Can universities continually produce graduates that have current and relevant skills to keep up with changing industry requirements?
- Do we keep writing new units?
- Or, should we try harder to collaborate with other faculties, universities and industry to provide targeted skills?

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MInT

Master of Innovative Technology

- International Master's Degree Program
- An Approach to Providing Key Research and Development Skills in Industry Growth Areas

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MInT
Master of Innovative Technology

The MInT Idea:

- Reverse Engineering course structure, through project focus on industry growth areas
- Use of experts by leveraging key skills and expertise from appropriate faculties and collaborating universities with required expertise
- Multi-disciplinary approach by encouraging innovative project development across disciplines, universities and countries
- Mobility: local, national and international
- Inter-cultural awareness

Introduction

Innovative course, aimed at producing graduates that can easily move into new technology positions. Specifically students will graduate with:

- **An understanding of multi-cultural issues related to working in different countries and how it specifically affects innovative technologies**
- **Skills in specific technology areas**
- **Skills in research design and methodology**
- **Skills in scope and conceptualising a research project proposal**
- **Ability to use correct tools and techniques in the chosen field of speciality**
- **An understanding of and the ability to apply processes of decision-making and team management in innovative technology development**

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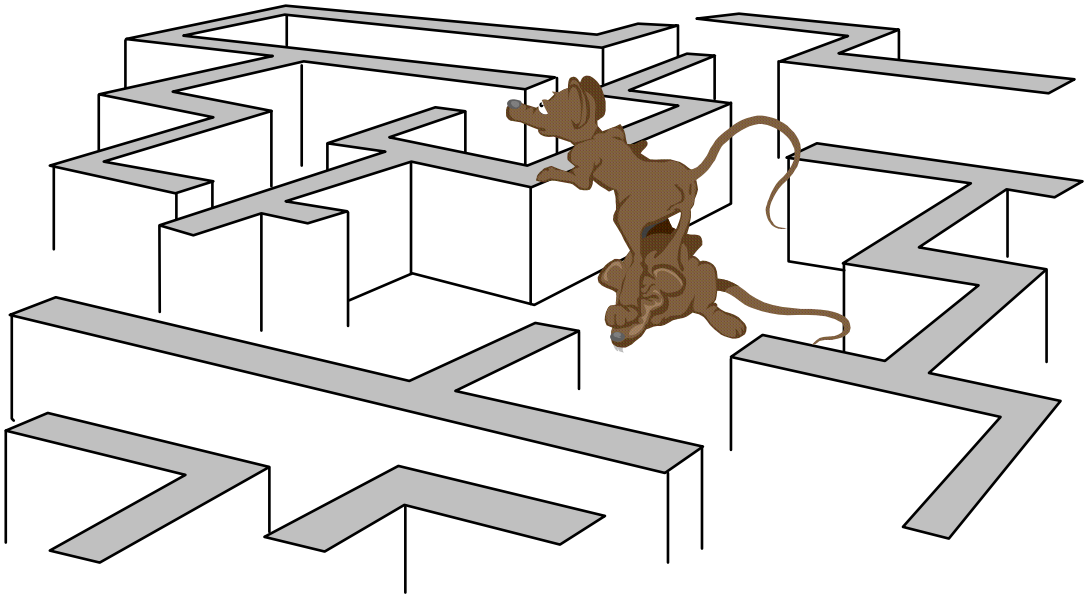
International Partners



Master's Degree Program with International Solutions

A consortium of international universities, each providing expertise will service the course by providing a specific theme. Proposed themes and collaborating universities include:

- **Edith Cowan University, Australia - E-Learning**
- **Kiel University of Applied Sciences, Germany – Information Technology, Multimedia Programming**
- **Texas A&M University, U.S.A. – Information Technology**
- **Coventry University, UK – Serious Gaming**
- **University of Vaasa, Finland – Mobile Media**
- **Technical University of Graz, Austria – Information Technology**
- **University of Aveiro, Portugal – Interface Design**

MInT Strategy

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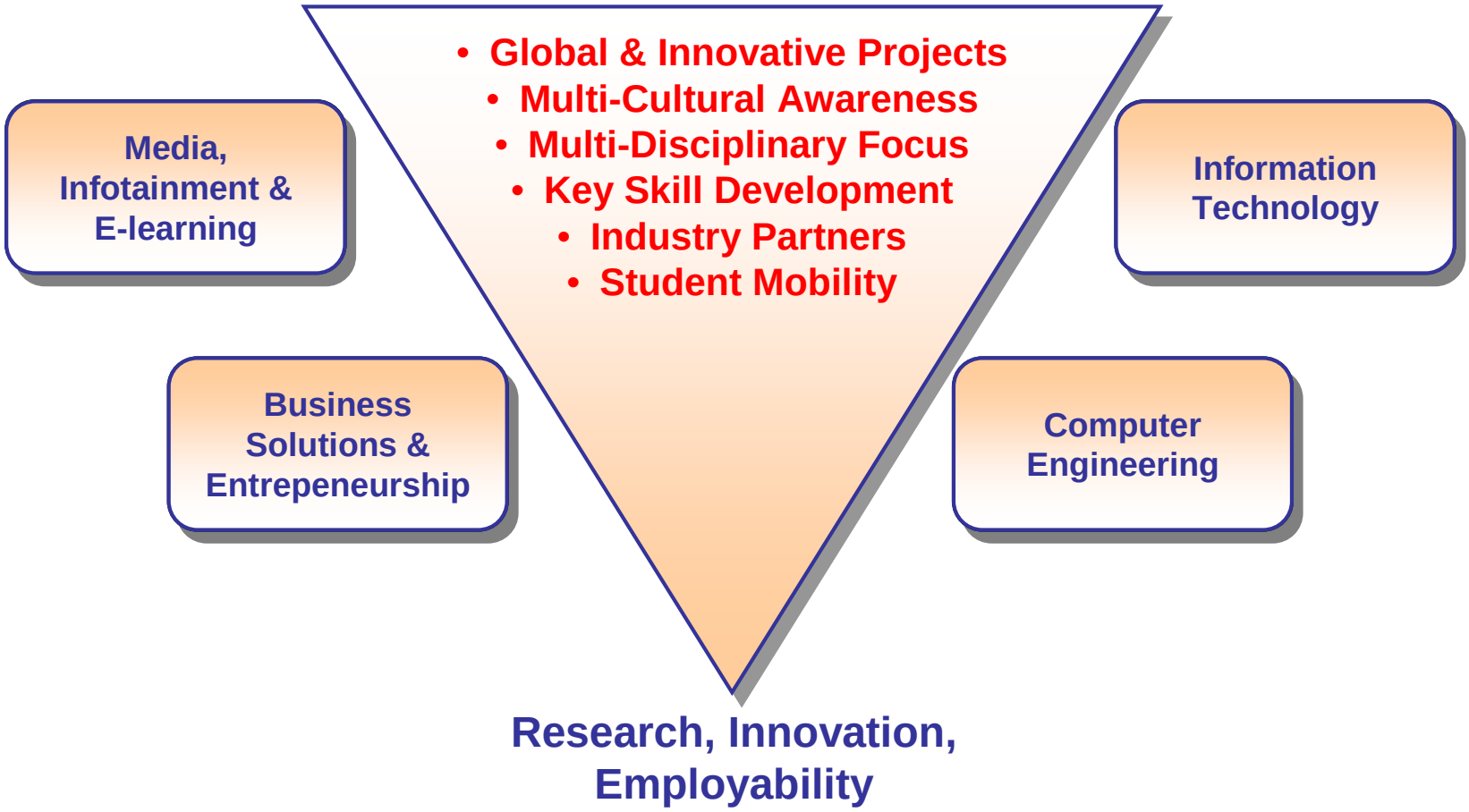
This strategy enables students to graduate with state of the art skills leveraged from international experts that gives them an advantage in a rapidly changing employment marketplace. International collaboration and mobility is promoted by encouraging students to travel overseas for one or two semesters.

It is also envisaged that staff mobility will be also be promoted to help gain skills in new specialist areas, as well as cultural experiences.

MInT Themes


• Global & Innovative Projects
• Multi-Cultural Awareness
• Multi-Disciplinary Focus
• Key Skill Development
• Industry Partners
• Student Mobility
Media, Infotainment & E-learning
Information Technology
Business Solutions & Entrepeneurship
Computer Engineering
Research, Innovation, Employability

MInT Structure

ECTS - European Credit Transfer and Accumulation System
à Bologna-Process

Course structure

Semester 1	Semester 2	Semester 3	Semester 4
7,5 cps Globalisation, Innovation and Culture Diversity	7,5 cps Research Methods and Project Management	15 cps Research Project and Thesis Preparation	30 cps Project/Thesis Unit
Elective Units (50% of the course) 60cps			

Half of the course of study is based on elective units and negotiated between the student and the Master of Innovative Technology coordinator.
This process of customising the elective units helps address immediate industry and community requirements, uses expert skill from different faculties/institutions, and promotes awareness of inter-cultural and globalisation issues.

MInT Structure

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MInT Summary

The Master of Innovative Technology bridges the industry/education nexus by identifying industry and community growth areas, and then supports students in customising the course structure to suit these needs, as well as their own aspirations.

Also, the multidisciplinary approach enables innovative projects to be developed that source expertise from a range of disciplines, including:

- **New Media, Communications and E-learning**
- **Information Technology, Software Development**
- **Hardware Development**
- **Business Solutions & Entrepreneurship**
- **Health and Wellness**
- **Other areas identified by industry or community**

This approach enables students to perform project work, and gain expertise in areas that are clearly in need of new skills, and in which specific courses haven't yet been developed. New growth areas include animated modelling, mobile technology content creation, serious gaming, 3D modelling, new information media for journalism and interactive TV.

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Doctor of Professional Studies

ProfDoc

Doctor of Professional Studies

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The Doctor of Professional Studies is specially designed for individuals working or researching in a particular professional or community area, and wishing to make an impact on their organization, community or profession.

Unlike many other professional doctorates, this programme offers a generic framework, which enables a wide range of professionals and leaders from the public, private, community and voluntary sectors to negotiate programmes of study that are customised for their needs.

Ideal candidates for this degree are:

- **Managers and leaders who combine experience with high intellectual capacity and curiosity**
- **Practitioners who view research as a tool for confronting complex business challenges**
- **Individuals who seek an advanced education while still maintaining a full-time position**

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Distinguishing Features

- Students negotiate a customised course targeting industry growth areas
- Tied to R&D
- Collaboration with other universities promoted by sharing expertise
- Student and staff mobility
- Multi-disciplinary approach
- Globalisation and multi-cultural issues promoted

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ProfDoc Summary

- HE is experiencing diminishing resources and students
- Globalisation and innovative technologies are creating new opportunities
- New skills are required which can be obtained through collaboration and mobility
- New collaborative, flexible models are needed!

à Collaborative Prof Doc

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2008/09 (NHIBE 2009 Santorini)

ACE –
ACADEMIC CLEARING-HOUSE OF EXCELLENCE

A new model and web portal to help promote international collaboration and global research, through these innovative master and doctoral degree programmes.

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A clearinghouse

typically constitutes a dedicated data base, providing specialized services for collecting and processing incoming data on one side and disseminating outgoing information as required on the other side. These input and output processes are controlled by a set of classification parameters, keywords and descriptors.

The development of the Internet and the globalization process have opened new opportunities and challenges for the traditional clearinghouse, considering the extended ways to acquire data and distribute information either using manually controlled processes or completely automated systems.

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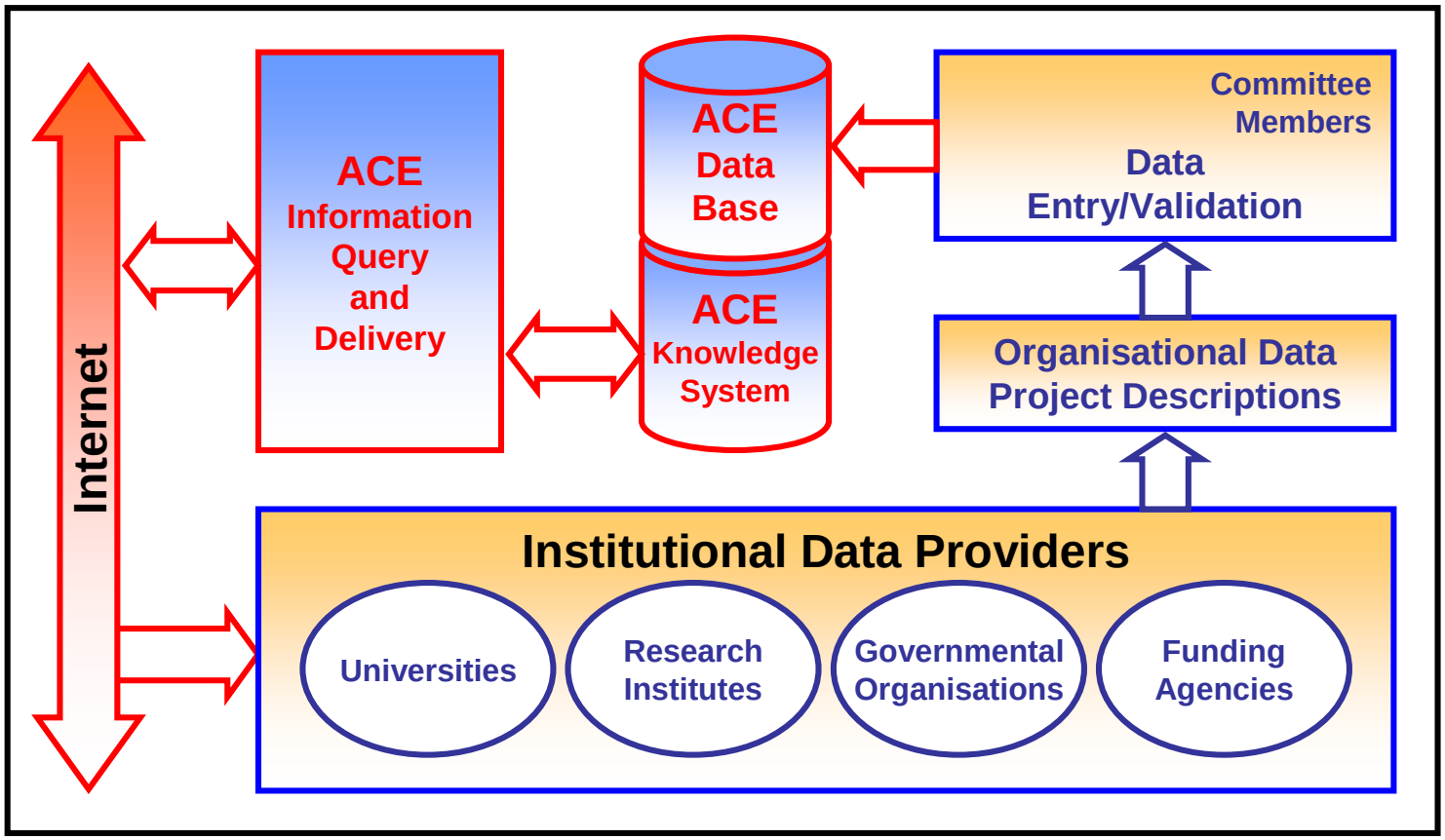
ACE

is following the design of these legacy systems. Authorized and accredited users can input data describing new research projects, study programmes, cooperation and exchange activities, funding opportunities, etc.

Although automatic data mining systems could be implemented this is not planned in the initial development and implementation phase of ACE. Instead a semiautomatic approach was chosen, allowing the international coordinators to supervise and filter the data definition and entry process.

ACE Architecture



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GLOBALIZATION AND INNOVATION WITH ACE

ACE offers industry, community groups and research students the opportunity to become more innovative by collaborating with other like minded universities, and also having access to current and relevant research topics and projects from other international higher education institutions and industry.

ACE has a global perspective on research and development and its collaborative approach to education allows industry, community, government and research students to customize the development of innovative courses with a view of improving business and community performance, while at the same time enhancing the careers of early career researchers.

International ACE

The ACE model works with a group of international universities collaborating together to support research in areas of growth and need from around the world. An online application enables members to define the following for each project:

- Description, objectives, scope, timeline, and resources available
- Type of research, such as applied, evaluation or pure research
- Required student profile and skill requirements
- Recommended course structure, including Doctoral, Masters or Undergraduate
- Funding, scholarship and sponsorship opportunities

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Committee members from representative institutions in each country invite industry, community and government represents to submit ideas for research and development.

They then edit and validate these, and upload them onto the main server. Client details will not be made public. Potential students and supervisors can search the database by discipline, scope, level and other criteria in order to locate appropriate projects. They then contact the committee member who would negotiate the project and research.

à Portal 2G

The ACE portal has been implemented using a new CMS based on a LAMP-type web server infrastructure, based on the Linux OS, the Apache web server, a MySQL database management system and PHP as a scripting language.

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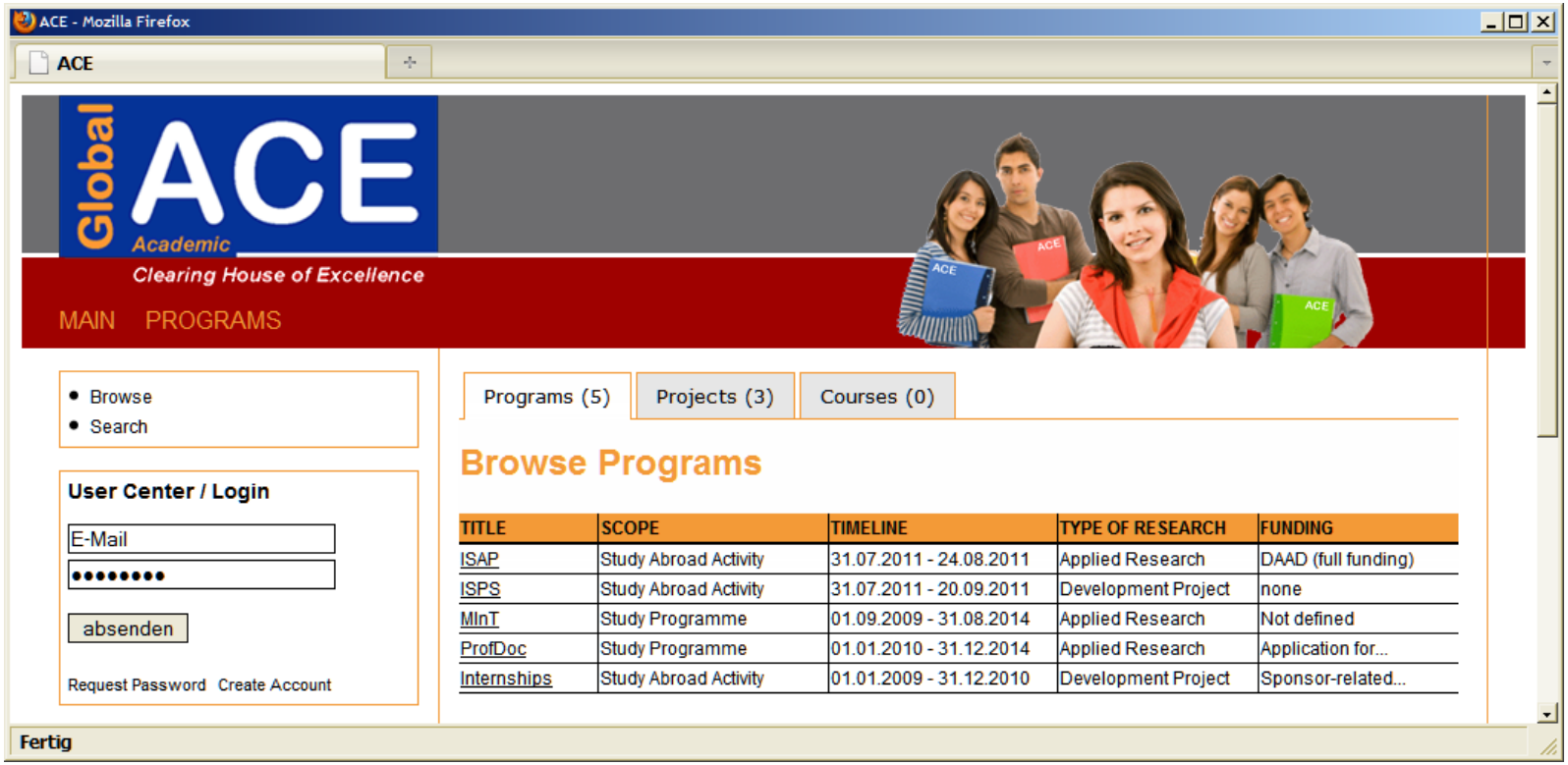
ACE – ACADEMIC CLEARING-HOUSE OF EXCELLENCE

Web Portal



ACE Portal


Global ACE - Details: ISPS - Mozilla Firefox
Global ACE - Details: ISPS
Global ACE
Academic
Clearing House of Excellence
MAIN PROGRAMS
Browse
Search
User Center / Login
E-Mail
absenden
Request Password Create Account
Details
Projects
Details: ISPS
International Study and Project Semester
The International Study and Project Semester (ISPS) defines a study period fully integrated into a Bachelor or Master's study program during which students will spend a study-abroad semester at a selected partner institution. The participating students will be actively involved in a team-oriented project strongly related to university or industry-based research and development. The international team will have a multidisciplinary composition, allowing students from different academic backgrounds to jointly work on a realistic (often real) problem (project), in which the co-operation of different disciplines might be vital for the total success. Examples could be engineering type projects, that need support from the design area as well as from marketing and even from the social sciences to study the impact that a new product will have in the market.
As part of their preparatory work the students will prepare a project plan which may have the function and quality of a detailed business plan. Obviously project management has to be an intrinsic component of the overall ISPS activity.

2010/11 - ISPS

The last decade has been characterized by a strong internationalization of the worldwide systems of higher education. Most prominent is the example of the European Higher Education Area (EHEA) that has been formed as part of the restructuring process known as the "Bologna process". Other countries have started similar initiatives recognizing the necessity of global co-operations, developing innovative and sustainable degree programs. The implementation of systems furthering the practical orientation of study programs can be considered as equally important. This applies to programs with a technical emphasis as well as to programs in the business or social area.

The traditional universities and universities of applied sciences are using phases in their programs dedicated to the accomplishment of practical study periods. Usually these study phases are officially established and included in the institutional study and examination regulations.

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2010/11 - ISPS

Different terms have been in use to refer to these phases in the educational programs

- **practicum**
- **project-based learning**
- **co-operative education**
- **industry-based learning**
- **community based learning**
- **learning by developing** → **EPS**
- **work integrated learning** → **MUTW**

just to name a few.
Evidently these programs can be quite different considering the mix of academic and practical phases, going up to full-time employment offers.
Example:
***Industry-Based Learning (IBL) is a program for undergraduate students in which they are offered the opportunity to undertake full-time, paid employment in industry, in an area relevant to their studies*.**

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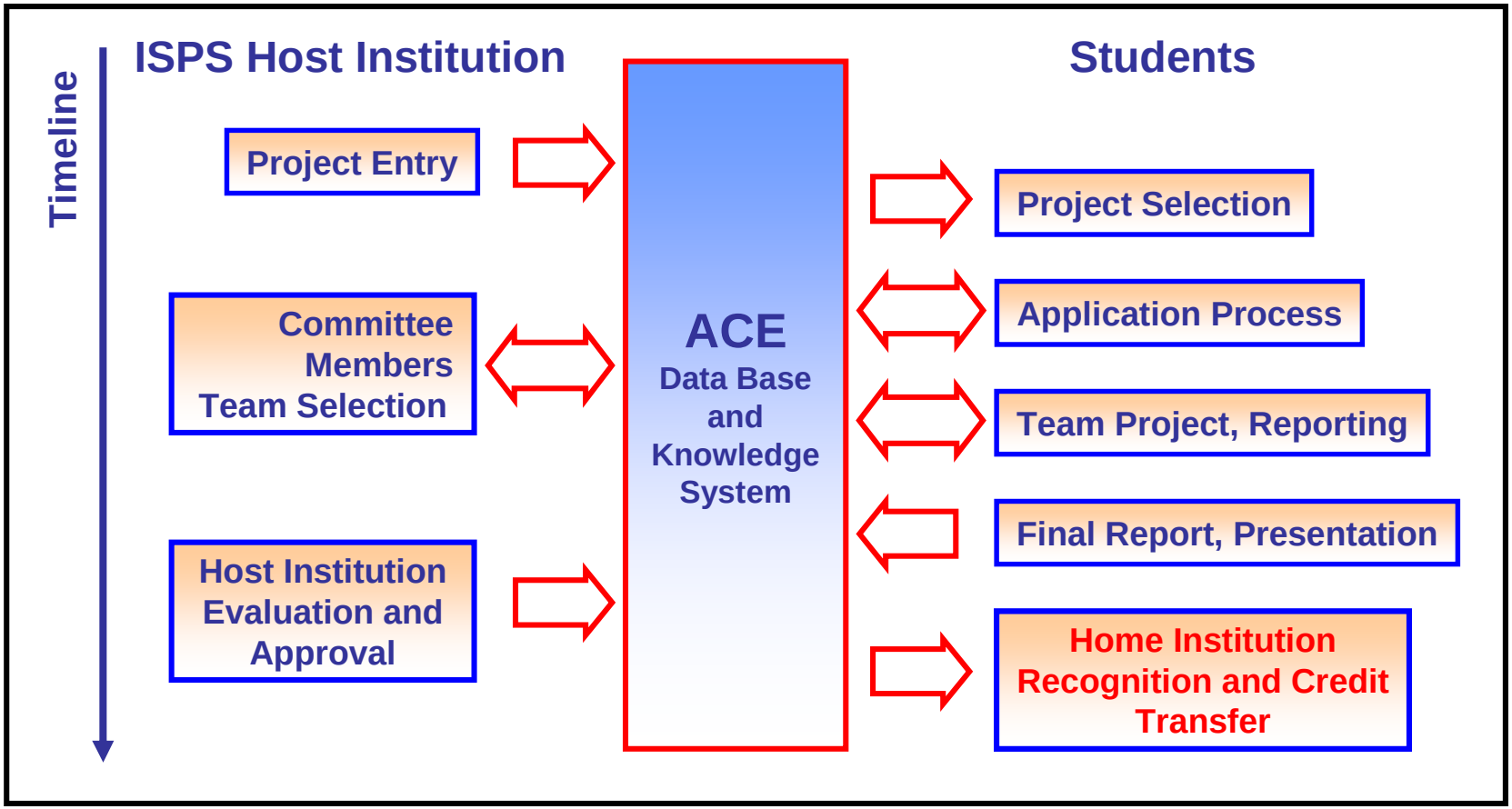
The International Study and Project Semester (ISPS) at Kiel University of Applied Sciences

defines a study period fully integrated into a bachelor's or master's study program during which students will spend a study-abroad semester at a selected partner institution. Participating students will be actively involved in a multidisciplinary team-oriented project strongly related to university or industry based research and development. Additionally they will study a predefined number of subjects related to their area of focus.

The emphasis of ISPS is on high-quality project work carried out by international teams, accompanied by a specialized study program from the host university's standard repertoire.

To coordinate the ISPS activities, the recently introduced Academic Clearing-House for Excellence (ACE) will be employed, giving potential candidates easy access to globally available ISPS-compatible R&D projects offered in new innovative growth areas.

ISPS


Timeline
ISPS Host Institution
Students
Project Entry
Committee Members Team Selection
Host Institution Evaluation and Approval
ACE
Data Base and Knowledge System
Project Selection
Application Process
Team Project, Reporting
Final Report, Presentation
Home Institution Recognition and Credit Transfer

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ISPS scenarios

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ISPS incorporated into an Information Technology Bachelor Degree program

Bachelor of Information Technology – BIT
(with focus on Internet application)
at Kiel University of Applied Sciences.

	Semester 1	Semester 2
Year 1	Courseware	Courseware
Year 2	Courseware	Courseware
Year 3	ISPS (including project and courseware) "or"	ISPS (including internship and thesis)

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ISPS incorporated into an Information Technology Master Degree program

Master of Information Technology – MIT
(with focus on Internet application)
at Kiel University of Applied Sciences.

	Semester 1	Semester 2
Year 1	Courseware	Courseware
Year 2	ISPS (including master's project and courseware)	Master's Thesis

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ISPS incorporated into a Capstone Project Bachelor's program

Bachelor of Science Engineering Technology – BSET
(with focus on Electronics and Telecommunications)
at Texas A&M Univeristy, U.S.A.

The BSET degree in Electonics and Telecommunications Engineering Technology (EET-TET) is a four-year Bachelor's program which includes a two-semester Capstone Design experience during the final year of study.

Students form three/four-person teams, identify a problem/opportunity development project with industry sponsorship and then plan, design, implement, test, document, and demonstrate a fully functional pre-production prototype of the solution. Generally, the product design will require hardware, software, communications (wired and/or wireless), and system integration.

The overall goal of the EET-TET Capstone Program is to transfer intellectual property in terms of know-how to the sponsoring company so that commercialization will follow.

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ISPS incorporated into a Capstone Project Bachelor's program

Bachelor of Science Engineering Technology – BSET (with focus on Electronics and Telecommunications) at Texas A&M Univeristy

The Capstone Program at Texas A&M University readily support the inclusion of ISPS projects requiring multidisciplinary teams.

- **Using technology, students form teams with students in other countries to do the first semester project management planning and initial design activities.**
- **The second semester work includes team members travelling from their home countries to the US to work directly with their EET-TET undergraduate team members, thus meeting the international host institution requirement of ISPS for study abroad.**

→ MUTW 2G

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ISPS IN COMPARISON

Several attempts have been made to launch project-oriented study programs, sometimes with different goals and often with mixed success.

Two prominent examples can be directly compared with the ISPS initiative:

- **EPS – European Project Semester**
- **MUTW – Multinational Undergraduate Team Work**

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The ISPS is expected to avoid the deficiencies of EPS and MUTW, offering:

- an international study-abroad semester at selected co-operating institutions not limited to Europe
- a clearly defined semester structure including a project and study program
- quality assured coursework (accredited*) units in the language of the host institution
- a state-of-the-art project phase carried out in a well-selected international team
- guaranteed credit transfer and recognition following well-defined schemes
- a study-abroad semester fully embedded in the home university study program

* Accreditation following internationally established rules, e.g.:
  - Established accred. Agencies in Germany (acc. Council)
  - ABED or similar in the U.S. / Canada / Australia

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IMPLICATIONS AND FUTURE WORK

- The outlined model recognizes the deficiencies of existing models and proposes an optimized project phase in which the focus on international, group-based collaboration is backed by a strong quality control and evaluation scheme.
- The program will be offered world-wide, primarily as an extension of existing partnerships.
- The implementation of the new ISPS model will require the development or adoption of adequate ways for credit transfer and recognition, and means for financial support of participating students.
- ISPS will use an Internet-based approach using a dedicated portal (ACE) to match teams, to prepare the necessary memoranda, to supervise the ongoing project work, and to collect the final documentation.
- It is expected that ISPS will help improve the employability of students, and thus will assist the institutions of higher education to fulfill one of their key tasks.

ACE-Server

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ACE is currently hosted at
Kiel University of Applied Sciences.
It is available in a preliminary release at:
http://www.global-ace.org.

Thank you!

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