

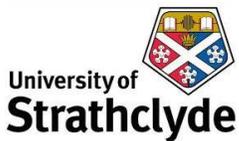


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Smart Grid Technology - A Master Program [SGT-MAP]

Strategic Plan



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Executive Summary

Highlights

SGT-MAP is one deliverable of the Erasmus+ funded project no. 574219-EPP-1-2016-1-UK-EPPKA2-CBHE-JP. The program is developed by the consortium members constituted from three European universities and four Egyptian universities. It has an essential role of providing the energy industry with qualified engineers in the field of smart grid in addition to increasing the awareness of the importance of smart grid technology. It thus contributes in solving energy-related problems in Egypt.

The program strives to foster the relation between academia, governmental bodies, and industry by offering a set of courses directed towards the needs of the energy sector. These courses are supported by a wide range of modern laboratory equipment covering the fields of integrated communications, sensing and measurement, advanced power system components, advanced control methods, and improved interfaces and decision support.

The program is offered by the electrical engineering department and is characterized by a multidisciplinary nature to provide the graduates with essential skills and capabilities for decision making in the wide field of electrical smart grid technology applications. The program targets the enrollment of high caliber students and aims to provide a distinct educational environment that is attractive and adapted to stakeholders' needs and their expectations.

Goals

The program has three strategic goals:

1. Provide Competitive Master Programs in the Field of Smart Grid.
2. Strengthen Innovation with Smart Grid Prospective Capabilities.
3. Serve in Solving Community Energy-Related Problems Efficiently.

Mission Statement

To increase the regional and national community awareness in the smart grid field through providing professionals and promoting interdisciplinary cooperation.

Program Vision, Mission, and Stakeholders

Program Vision

The vision of this program is to be locally, regionally and internationally recognized as one of the ambitious master programs in the field of smart grid and its related technologies.

Program Mission

The mission of this SGT-MAP program is:

To increase the regional and national community awareness in the smart grid field through providing professionals and promoting interdisciplinary cooperation.

Program Stakeholders

This program is planned to work closely with an extended network of stakeholders that is classified in to three levels:

- *Internal level:* Students, staff members, administrative and technical staff.
- *National level:* Business and industrial enterprises, local governmental bodies and educational authorities such as ministry of electricity and renewable energy and Ministry of Higher Education and scientific research, Ministry of Electricity and Renewable Energy, Egyptian partner universities and community service organizations.
- *International level:* Foreign European partner universities.

Program Values

The following are recommended core values to be considered in the program:

- *Establishing an international institutional reputation through a spirit of innovation in higher education.*
- *Preparing graduate students to be critical thinkers and lifelong learners and to be continually engaged in as citizens in community service activities.*
- *Delivering a well-recognized, accredited and an outstanding professional and graduate program.*
- *Enhancing the spirit of diversity, and multidisciplinary teamwork.*
- *Contributing in solving energy-related problems and challenges in the country and possibly in the region.*

Program Credibility and Effectiveness

With the fast-growing of restructuring existing power grids into smart grids that enable greater use of renewables and more efficient energy consumption, the opportunities for innovative ideas, new businesses and creative engineers are growing. This program provides graduates with a solid foundation for a career in smart electrical grids and its technologies – either in academia or industry. The program features both theoretical and practical learning, as well as plenty of group activities, allowing students to develop complementary skills that further improve their desirability on the job market. Furthermore, it addresses key topic areas of significant interest to smart electrical industry in a powerfully interdisciplinary fashion, providing many opportunities for research, joint projects and innovative applied ideas. On completion of the program, the graduates will enjoy the necessary skills for both, research and developments, e.g.

understanding and developing existing and future smart grid systems, design innovative smart grid applications and understanding and enhancing existing solutions. Therefore, graduates from this Master's program will have exceptional opportunities to engage with commercial and research organizations that are actively working in the field of electrical smart grids. The program also provides an excellent foundation for PhD studies in the field of smart grid technologies.

Program Markets Sustainability

Since the main objective of this graduate program is to provide a master degree in smart grid technologies, therefore the graduate students and the industrial sector in the area of electrical smart grid represent the main targeted market segment of this program. In this context, several policies need to be continuously considered during the execution and operation of this program in order to guarantee its markets sustainability which are:

- Attract students of high caliber and potential to be enrolled in the program.
- Collaborate with undergraduate studies to develop pipeline programs to recruit talented students into this graduate program.
- Increase awareness about the program and its goals as well as its related career opportunities for the graduates.
- Increase name recognition for the master program among potential graduate students, influencers, and industrial partners.
- Facilitate the offering of this program to non-traditional students at times that will make this program more accessible to them.
- Recruit and retain the best faculty and staff for teaching and research activities.
- Provide a distinct educational environment that is attractive and adapted to stakeholders' needs and their expectations.
- Establish collaborations with governmental agencies and industrial partners to continuously refine the curriculum and identify new needs and

learning opportunities for program graduates as well as conducting applied research projects.

- Strengthening bonds with the community and the industry (public and private sector) and involving them in the program development and decision-making.

SWOT Analysis

SWOT analysis is an integral part of the strategic planning process. It aims at identifying internal and external factors affecting the program. SWOT stands for strength, weakness, opportunities and threats. Internal factors are expressed by strengths and weaknesses, while external factors are presented by opportunities and threats.

A team has been formed to identify the strengths, weaknesses, opportunities and threats for the prospective SGT-MAP. These have been discussed in the kick-off meeting in Aberdeen, UK. A questionnaire form has been developed and distributed among stakeholders as well as consortium members. The output of the questionnaire has been analyzed and used to set the strategic priorities for the program. In the following the results of the SWOT analysis are given.

Strengths

The main strengths as revealed by the questionnaire are as follows:



- 1. High national reputation of the beneficiary university*
- 2. Respective qualifications of the associating staff members*
- 3. High quality of the applying students*
- 4. Full spiritual support from the top management*
- 5. Planned smart grid laboratories in the beneficiary university*
- 6. Multidiscipline provided by the curriculum*
- 7. Cooperation with international reputable universities offering specialized postgraduate degrees in smart grid applications*
- 8. Potential future marketing of the project outcomes among other universities*

Weaknesses

The main weaknesses for SGT-MAP are the following:



1. First experience for the involved staff members in developing the proposed program
2. High cost for maintenance and upgrade of lab facilities
3. Heavy teaching and administrating loads upon the involved staff members
4. Lack of awareness about the importance of the smart grid applications
5. High program admission fees
6. Student preparedness at entrance

Opportunities

Based on the external factors, SGT-MAP has the following opportunities:



1. Potential target candidates would include key persons in the smart grid applications field.
2. Graduates may occupy leading positions in the field of smart grid applications
3. Cooperation with /involvement of Governmental R/D funding organizations.
4. organizations.
5. Cooperation with/involvement of Private R/D funding organizations.
6. High demand due to the diversification of specialties who would join the program.
7. No similar programs offered in Egypt
8. Obtaining accreditation from international bodies will increase program reputation
9. Providing professional training courses for the industry

Threats

The following threats may face SGT-MAP:



1. Continuity of instability of foreign exchange rates.
2. Level of commitment and continuity of registering students.
3. Administrative complications in importing equipment.
4. Weak communication with stakeholders
5. Competition through similar programs offered online or by other local universities.
6. Changes in energy related policies and legislations.
7. Changes in electricity pricing schemes.

Strategic Challenges and Priorities

Based on the recommendations resulting from the SWOT analysis, the following priorities have been identified for achieving the program vision and mission. The priorities are not listed in the order of their importance. These priorities have been used to formulate the strategic goals presented next.

The SGT-MAP has the following priorities:

1. Deliver modern and market relevant courses in smart grid.
2. Enhance smart grid related knowledge and improving the skills of the teaching staff.
3. Cooperate with partner universities, enterprises, and governmental authorities.
4. Awareness of smart grid benefits especially in sorting out the energy crisis.
5. Design and building laboratory experiments related to smart grid technologies.

Program Strategic Goals

Goals

1. **Provide Competitive Master Programs in the Field of Smart Grid.**
2. **Strengthen Innovation with Smart Grid Prospective Capabilities.**
3. **Serve in Solving Community Energy-Related Problems Efficiently.**

Goal 1: Provide Competitive Master Programs in the Field of Smart Grid

Objectives:

1. *Exploiting the state-of-the-art in the graduate courses.*
2. *Targeting high level quality applicants.*
3. *Achieving program reputation.*

Objective 1: Exploiting the state-of-the-art in the graduate courses

Policies:

1. *Explore the state of art of the available national and international courses in the field of smart grid*
2. *Integrate relevant innovation, research and industry needs in the program courses.*

Objective 2: Targeting high level quality applicants

Policies:

1. *Convey the message about the program.*
2. *Refining admission strategy & standards.*
3. *Offering scholarships for outstanding students.*

Objective 3: Achieving program reputation.

Policies:

1. *Establishing quality assurance system.*
2. *Acquiring national & international accreditations.*
3. *Evaluate and asses the innovation level in graduates' research.*

Objective	Policy	Responsibility	Date	Metric
Objective1: Exploiting the state-of-the-art in the graduate courses	1. Explore the state of art of the available national and international courses in the field of smart grid	Staff Team	Courses design stage	Review from partner and program Universities
	2. Integrate relevant innovation, research and industry needs in the program courses.	Staff Team	Each semester	Survey, workshops
Objective2: Targeting high level quality applicants	1. Convey the message about the program	Staff Team	Courses design stage	Workshops, Presentations, advertising
	2. Refining admission strategy & standards	Staff Team	The first study term	acceptance rate, GPA of admitted students
	3. Offering scholarships for outstanding students	Staff Team	After the first study term	Number of scholarships
Objective 3: Achieving program reputation.	1. Establishing quality assurance system	Staff Team	Courses design stage	Quality audit results
	2. Acquiring national & international accreditations	Staff Team	Courses design stage	Reports Professional Visits Workshops

Goal 2: Strengthen Innovation with Smart Grid Prospective Capabilities

Objectives:

1. *Inspiring graduates to have professional expertise*
2. *Providing a creative environment*
3. *Motivating and Enriching Staff capabilities.*

Objective1: Inspiring graduates to have professional expertise.

Policies:

1. *Encourage graduate students to exploit research & innovation.*
2. *Increase students' awareness of the relevant research areas.*
3. *Encourage graduate students to exploit courses goals in solving community problems.*

Objective2: Providing a creative environment.

Policies:

1. *Establishing advanced smart grid facilities.*
2. *Conducting research projects within the designed master program.*
3. *Applying innovative teaching and learning methods.*

Objective3: Motivating and Enriching Staff capabilities

Policies:

1. *Conducting training programs in the smart grid field.*
2. *Encouraging knowledge transfer through joint national and international collaborations.*

Objective	Policy	Responsibility	Date	Metric
<i>Inspiring graduates to have professional expertise</i>	1. Encourage graduate students to exploit research & innovation.	Staff Team	Courses design stage	Reports Student projects Visits
	2. Increase students' awareness of the relevant research areas.	Staff Team	During course design	Reports Student projects Visits
	3. Encourage graduate students to exploit courses goals in solving community problems.	Staff Team	During course implementation	Student projects Reports publications
Objective2: Providing a creative environment	1. Establishing advanced smart grid facilities.	Staff Team	During course design	Smart grid Labs
	2. Conducting research projects within the designed master program	Staff Team	each semester	Number of Student projects Prototypes publications
	3. Applying innovative teaching and learning methods	Staff Team	each semester	Lectures Reports Student feedbacks
Objective3: Motivating and Enriching Staff capabilities.	1. Conducting training programs in the smart grid field	Staff Team	During course Design and implementation	Number of staff members attending Workshops Lectures
	2. Encouraging knowledge transfer through joint national and international collaborations	Staff Team	During course Design and implementation	Number of Workshops organized, Partners visits/number of joint projects or publications

Goal 3: Serve in Solving Community Energy-Related Problems Efficiently

Objectives:

1. Fostering the relation between master program and industry.
2. Developing innovative solutions for energy related problems.

Objective 1: Fostering the relation between master program and industry

Policies:

1. Exploring new partnership with national and international industries.
2. Involving industrial communities in decision making process.
3. Engage several staff from industry in the conducting of the master program.
4. Encouraging program's students to conduct industry internship.

Objective 2: Developing innovative solutions for energy related problems

Policies:

1. Addressing real Energy-Related Problems within program projects.
2. Promoting technology commercialization and spin-off services.

Objective	Policy	Responsibility	Date	Metric
Objective 1: Fostering the relation between research and industry	1. Exploring new partnership with national and international industries	Staff Team	During course Design and implementation	Number of Protocols, workshops
	2. Involving industrial communities in decision making process	Staff Team	Annually	Number of Workshops Reports, survey results
	3. Engage several staff from industry in the conducting of the master program	Staff Team	Annually	Agreements Reports
Objective 2: Developing innovative solutions for energy related problems	1. Addressing real Energy-Related Problems within program projects	Staff Team	During course implementation	Projects, Prototypes
	2. Promoting technology commercialization and spin-off services	Staff Team	Annually	Prototypes, patents spin-off companies