



MANUAL ON METHODOLOGY FOR RES COURSES

Guidelines for the elaboration of syllabus and didactic materials

Manual on “methodology for the development of courses on RES” aims at proposing a guidelines to DIEGO Partners in order to set up a fitting and adequate didactic scheme.

The Manual summarizes the results of the n. 3 National reports, and provides the guidelines for the elaboration of the RES courses, for the development of didactic plans fitting the market demand on the basis of existing resources and on resources.

INTRODUCTION

DIEGO (Development of quality system through EnerGy Efficiency CoursEs)

Description

The main objective of DIEGO project is to improve that capacities of 6 Universities on renewable energy, energy efficiency and sustainability, training new experts prepared for the labour market. The project aims at answering the growing request of energy in Latin America and the necessity to cover it with clean and sustainable sources. All countries involved in DIEGO have a great potential in term of renewable energy generation. The National Governments are promoting national laws in supporting of RES adoption, mainly of small systems, which can contribute to the reduction of poverty, guaranteeing the electricity also in the remote areas. The application of new incentives and regulations for the spreading of RES has to be supported by the presence of experts and technician in the field of renewable technologies.

Partners

Sapienza University of Rome,
University of Cadiz Spain,
University of Cyprus Role: Program Country
Universidad Rafael Landívar de Guatemala Guatemala,
Universidad de la República Uruguay,
Universidad Nacional De Chilecito Argentina,
Universidad Nacional Del Sur Argentina,
Universidad Nacional De San Luis,
Universidad San Carlos de Guatemala Guatemala: replaced by Universidad Galileo, Guatemala.



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METHODOLOGY

[Description of the Logical approach used to define the n. 6 main topics, the syllabus and in the elaboration of the didactic materials, included the contribution of the European Partners:

The course was divided in n.6 modules, mainly following the market expectancies and the academic possibilities of the Higher Education Institutions (HEI) involved, as defined by the surveys that were previously completed. Other arguments were considered, as f.i., the geothermal potential of Argentina which, although not yet profited by private companies or government is, however, mentioned in different specialized publications.

1. Analysis of local needs: first the elaboration/submission of survey and then the description of National status.

The survey was performed by way of e-mail consultations that were answered, in Argentina by a total of 13 institutions, roughly a 10% of the institutions consulted. The low interest showed by the institutions on the survey does not correspond with the success the before mentioned Governmental tenders for provision of RREE has had.

The detailed results of the corresponding survey are included in the National Reports. In general, the interest of the different institutions surveyed is mainly focused on. Biomass, Solar Photovoltaic, Solar Thermal and Wind energies, which are, by the way, the main technologies involved in the offers the Argentinian National Government has received in its recent calls for tenders RenovAr 1, RenovAr 1.5 and RenovAr 2. Energy Efficiency and Energy from waste are also mentioned.

2. Analysis of University offers: modules, courses, programs and facilities/laboratories

The different LA HEI partners in DIEGO have very different existing capacities related with the delivery of RREE courses. Some of them have these kind of courses already on their regular offer, some have partial capacities and some have only the basic capacities involving professors and didactic materials, but all of them have the highest interest on developing these capacities now and maintaining them in the future.

The University’s answers regarding teaching needs’ survey is also presented. It includes answers from all 6 LA HEI.

In general, all LA HEI have some activities on RREE, though none is covering all the disciplines to be covered with DIEGO.



Teaching equipment is also only partially operating in the n. 6 LA HEI of the consortium, as is the equipment suited to teach those disciplines.

Some LA universities have a quite complete staff on these issues, and other have very few and will use the project to complete that staff.

3. Evaluation of different University systems: Europe/Bologna process, Argentina, Uruguay and Guatemala.

In general, LA HEIs have a growing interest on the Bologna process way of accreditation or university careers. Basing the projected subjects on competences, and focussing on students has shown to be an excellent way of integrating HE systems among different countries, and, often, within one country big enough to have different university cultures, procedures and environments, as is the case with Argentina.

The credits recognized to the students by way of the competences recognized could, eventually, be used to certify such competence to deserting students after their second or third year as students, helping them to enter the labour market.

Because of these and other reasons, the Bologna process is being analysed with interest in LA's academic system, as is the case of the CONFEDI (Concejo Federal de Decanos de Ingeniería) an organization formed by Deans of the different Engineering careers of different universities in Argentina.

4. Matrix of topics/needs, EU/LA standards (see Quality Manual of Lisa) – Template of syllabus.

According to the enquiries' results, the different countries have different priorities regarding the RE different topics, as follow (Uruguay needs are deduced from the current distribution of the electric generation matrix in the country):

DIEGO project: Matrix on topics of training needs

COUNTRY	ARGENTINA	GUATEMALA	URUGUAY (after current distribution of generation)
1st	Biomass	Hydroelectric	Biomass
2nd	Wind	Photovoltaic	Hydroelectric
3rd	Biofuel	Wind	Biomass, other
4th	Energy from waste	Solar Thermal	Wind
5th	Photovoltaic	Biomass	Biofuel
6th	Energy Efficiency in Industries	Biofuels	Solar
7th	Solar Thermal	Energy Efficiency in lighting	
8th	Energy Efficiency in lighting	Energy from waste	
9th	Energy Storage	Geothermal	
10th	Hydroelectric	Energy Efficiency in isolation	
11th	Energy Efficiency in isolation	Energy Efficiency in Industries	
12th	Co- Tri generation	Co - Tri generation	

The Syllabus are to be presented on Bologna process' defined templates, a model of which follows:

Course Number	Title	ECTS

Instructor	Email

Suggested Workload (enter total hours per semester – 15 week semester : 13 week lectures plus 2 weeks exams)						
Instruction	Tutorial	Lab	Homework	Exam Preparation	Projects	Other (specify)

Semester Offered	Recommended Semester (fill if you suggest to move the course to a different semester)

Prerequisites (Include the minimum prerequisites. Also include suggested topics not currently covered by any course)

Co-requisites

Course Objectives

Learning Outcomes
After the completion of this course the students should be able to: –



DIEGO

Development of quality
system through Energy
Efficiency courses

Course Description

Suggested Changes to Course Description

(Include possible modifications to the course description e.g., moving topics from one course to another, etc.)

Bibliography

Reference Books:

[Title]

[Author(s)]

[Editor]

Assessment

The final grade for the class depends on the following metrics:

5. Definition of titles and Main topics, during the meetings, EU and LA responsible for the coordination of modules' development.

In the SC meeting in Rome (October 2016), according to the results of the enquiries, shown in the above point, and since Hydroelectricity was considered as a highly specific subject for which ample university training offer was to be found in the LA countries of the Consortium, the following topics were chosen for the 6 different modules:

- Solar Photovoltaic
- Solar Thermal
- Wind Energy
- Biomass and Geothermal
- Energy Efficiency
- Emerging Technologies.

In the same SC meeting the decision was taken to relay each different topic in a different university of the Consortium.

Hence, the following distribution was decided regarding the responsibilities for syllabus completion:

- Solar Photovoltaic (UNS)
- Solar Thermal (UDELAR)
- Wind Energy (UNSL)



- Biomass and Geothermal (UNDEC)
- Energy Efficiency (U. R. Landivar)
- Emerging Technologies. (Universidad San Carlos (Guatemala))

Later San Carlos of Guatemala withdrew from the project, and its place was taken by Universidad Galileo, also from Guatemala. Yet, the syllabus for Emerging Technologies was already prepared by the Scientific Comitee of DIEGO in the meeting at Cyprus.

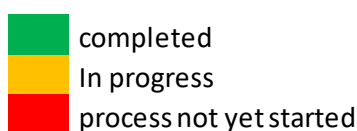
INTERNATIONAL RECOGNITION

1.1. Bilateral Agreements

Bilateral agreements are to be signed amongst all the Universities of the Consortium. Some of them have already being signed. Those which are not will be completed and signed within the period of the Project.

As of 21/11/17, the matrix corresponding to this issue is as follow, with green meaning agreement signed, yellow agreement being analysed by the institutions and red agreement to be implemented.

PARTNERS	University of Sapienza Rome	University of Cyprus	Universidad Rafael Landivar	University of Cadiz	Universidad de la República	Universidad Nacional de Chilecito	Universidad Nacional del Sur	Universidad de San Luis	Galileo University	Universidad de San Carlos
University of Sapienza Rome	Black	Red	Green		Green	Green	Green			
University of Cyprus	Red	Black			Yellow	Red	Yellow			
Universidad Rafael Landivar	Green	Red	Black	Green	Red	Red	Red	Red		
University of Cadiz				Black		Green	Green			
Universidad de la República	Green	Yellow		Green	Black		Green	Green		Green
Universidad Nacional de Chilecito	Green	Red	Red	Green	Red	Black	Green	Green		
Universidad Nacional del Sur	Green	Yellow	Red	Green	Green	Green	Black	Green		
Universidad de San Luis	Red	Red	Red	Red	Red	???	Yellow	Black		
Galileo University										
Universidad de San Carlos										





1.2. Approval of modules in Latin America

In general, Latin American Universities' courses and university careers have to go through an Accreditation process which, in some cases is performed only within the HEI and in others involve the approval by a centralized academic Agency, such as Argentina's CONEAU.

Regarding this course, in general, the depth choose for the course involved needed only internal approval, which simplified the administrative steps and accelerated the timetables for the approvals.

Even though it is not the usual procedure in some Latin American universities, DIEGO's courses were presented, and approved, on the Bologna process scheme, i.e. with the template provided by the project, as shown above.

1.3. Recognition of ECTS

Although one of the project's original objective was to recognize ECTS credits in the European academic system to the students that would finish appropriately and approve all the modules at the LA HEI's, it was finally stated that the objective is not possible to fulfil since the modules are being taught by professors that do not belong to European Universities. So, the objective was modified to the closest possible one: the modules will be prepared, documented and presented accordingly to the European Academic requirements (Bologna process), so that the students that want to continue their postgraduate studies at European Universities could be in good position to present them for credit recognition at the selected University.