

General Information	
Academic subject	Renewable energy in agriculture
Degree course	Gesvis
Curriculum	
ECTS credits	6
Compulsory attendance	No
Language	Italian

Subject teacher	Name Surname	Mail address	SSD
	Antonio Pantaleo	Antonio.pantaleo@uniba.it	AGR 09

ECTS credits details			
Basic teaching activities	32 hours lecture	28 hours lab and field	

Class schedule	
Period	II semester
Year	
Type of class	Lecture- workshops

Time management	
Hours	150
In-class study hours	60
Out-of-class study hours	90

Academic calendar	
Class begins	5th March, 2018
Class ends	22nd June, 2018

Syllabus	
Prerequisites/requirements	Maths, physics
Expected learning outcomes	<p>Knowledge and understanding The student will acquire skills and knowledge concerning energy management, energy conversion systems (renewable and fossil energy source) for heat and power in agricultural and agroindustrial sectors. The educational goals, in terms of skills and knowledge, are reported in Annex A of the Teaching Rules of the Master Programme on Sustainable Management of the mediterranean Countryside (expressed as european teaching targets indicators, Biosystems Engineering field of activity).</p> <p>Applying knowledge and understanding Knowledge of basic technologies for renewable energy and conventional energy conversion and energy efficiency in agriculture Making informed judgements and choices Carry out cost-benefit analyses and financial appraisals of energy investments</p> <p>Communicating knowledge and understanding Describe energy saving options for a wide range of energy consumers in agricultural and food processing sector and advise end users about best investment strategies</p>

	<p>Capacities to continue learning</p> <p>Knowledge of technical advancements in renewable energy and energy savings, and of the legislative framework to support energy efficiency and renewable energy in agriculture, together with main environmental implications of energy systems</p>
Contents	
Course program	
Bibliography	<ul style="list-style-type: none"> • <i>Notes from lectures</i> • <i>Riva G, Approvvigionamento energetico e tecnologie di conversione, Edagricole, Bologna 1990. (italian)</i> <p><i>Additional readings</i></p> <ul style="list-style-type: none"> • <i>CGIR Handbook of agricultural engineering, Volume V, Energy and biomass engineering, ASAE, 1999.</i> • http://www.cigr.org/documents/CIGRHandbookVol5.pdf
Notes	
Teaching methods	<p><i>Lectures will be presented through PC assisted tools (PowerPoint, Adobe Acrobat, etc.).</i></p> <p><i>For foreign students (LLP-Erasmus, Tempus, etc): CGIR Handbook of agricultural engineering, volume V, Energy and biomass engineering, ASAE, 1999.</i></p> <p>http://www.cigr.org/documents/CIGRHandbookVol5.pdf</p>
Assessment methods (indicate at least the type written, oral, other)	<p><i>The exam consists of an oral test with questions related to the programme.</i></p> <p><i>The partial exam during the teaching course for students attending classes consists of an oral test. This test concurs to the evaluation of the final exam, and in this case the final score is the average of the score in partial exam and final exam. Evaluation is carried out on a base of maximum 30 points and the student is successful with a minimum of 18 points.</i></p> <p><i>The evaluation is carried out on the basis of criteria detailed in Annex A, teaching Rules of master in sustainable management of Mediterranean countryside.</i></p>
Evaluation criteria (Explain for each expected learning outcome what a student has to know, or is able to do, and how many levels of achievement there are.	<ul style="list-style-type: none"> • <i>knowledge and understanding</i> <ul style="list-style-type: none"> ○ quantification of energy consumption of agricultural sector and agro-forestry end users on the basis of a set of input data • <i>applied knowledge and understanding</i> <ul style="list-style-type: none"> ○ carry out cost-benefit analysis of investments for on site energy generation in agricultural sector, by means of conventional and renewable energy sources, and quantification of financial profitability of investments in energy efficiency for food processing and agro-forestry activities. • <i>Making informed judgements and choices</i> <ul style="list-style-type: none"> ○ Carry out energy yield analyses for renewable energy systems and comparisons of techno-economic and environmental performance of energy technologies in

	<p>light of the legislative framework</p> <ul style="list-style-type: none"> ○ Quantification of environmental impacts of energy systems for agriculture • <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> ○ Communicating to end users the investment opportunities and technology basics of renewable and fossil energy investments, describe the fundamentals of heat transfer processes and energy conversion technologies • <i>Capacity to continue learning</i> <ul style="list-style-type: none"> ○ Capacity to understand technical data sheets of energy technologies and preliminary sizing of energy equipments to cover heating, cooling and electricity demand of agricultural sector, compare different technical solutions in light of future advancement of technology and legislative framework, adopting a reliable methodology for energy assessment
Further information	