



# UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2021/2022
BACHELOR'S DEGREE (BSC)	ENERGY ENGINEERING AND RENEWABLE ENERGIES
SUBJECT	ENERGY PLANNING AND MANAGEMENT
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50299-Ingegneria energetica
CODE	20466
SCIENTIFIC SECTOR(S)	ING-IND/10
HEAD PROFESSOR(S)	CARDONA FABIO      Ricercatore a tempo determinato      Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	9
INDIVIDUAL STUDY (Hrs)	144
COURSE ACTIVITY (Hrs)	81
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	ENERGY PLANNING AND MANAGEMENT - Corso: INGEGNERIA MECCANICA ENERGY PLANNING AND MANAGEMENT - Corso: MECHANICAL ENGINEERING
YEAR	3
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	<b>CARDONA FABIO</b> Monday    10:00    12:00    Stanza del Docente n. 1019 - edificio 9 - piano primo - Dipartimento di Ingegneria

<b>PREREQUISITES</b>	not mandatory
<b>LEARNING OUTCOMES</b>	<p>Knowledge and ability to understand:          At the end of the course the student will have acquired knowledge on the technologies and methods for achieving energy saving targets, as well as on the rationality of evolutionary scenarios inherent in both a higher level of politics energy, be a lower level, for individual operators in the domestic sector, tertiary and industrial sectors.          Method of assessment: theoretical questions in the context of the oral interview.          Ability to apply knowledge and understanding:          The student will have the ability to apply knowledge and methodologies acquired for conducting simple energy and economic analyzes, nonche 'comparative analysis between piu' impiantistiche solutions for the soddisfacimento of the energy requests of some types of users. The student will also be able to independently face problems of energy management, of analyze energy supply contracts.          Assessment methods: practical questions and applications in the interview oral.          Autonomy of judgment:          The student will be able to interpret the development scenarios of the market energy, including through training acquired at the level of legislation in energy, and to recognize the potential for intervention in the rationalization of energy conversion and utilization systems of audience.          Method of assessment: analysis (within the oral interview) of the mode of interpret the practical problems in the light of the theoretical principles studied, identifying those more 'adherent to the specifics of the situation examined.          Communication skills:          The student will be able to communicate with competence and properties of language regarding complex problems concerning planning energy conversion processes, in both small and high power.          Method of assessment: analysis (within the oral interview) of the properties of language and of the ability to express correctly simple and more complex concepts.          Learning skills          The student will be able to acquire, thanks to the skills acquired and through further third level training or directly in the field, further highly specialized knowledge related to the management tools of the electricity and gas industry, thermal integration of the process for savings energy in industry, to the methods of conducting energy audit and energy assessment of existing users.</p>
<b>ASSESSMENT METHODS</b>	<p>Evaluation is made with a final oral exam.          The student will have to answer, within the final interview, to a minimum of three questions on the topics covered by the course, and in particular concerning both planning and regulation issues in the sector energy, either to technological solutions or methods for the attainment of savings and energy efficiency targets for specific types of users civil or industrial.          The test is aimed at ascertaining the possession of skills and knowledge disciplinary measures foreseen by the course, and tends to verify the comprehension of the topics, interpretative competence, processing and exhibition skills e autonomy of judgment in practical applications.          The threshold of sufficiency will be reached when the student shows knowledge and understanding of topics at least in the main lines and have the ability to correctly tackle at least simple applications related to energy analysis and to the hypothesis of rationalization of processes of energy conversion; the student must also possess sufficient exhibit and argumentative capacities, such as to allow the transmission of his knowledge to the examiner.          Below this threshold, the examination will be insufficient.          The final interview concerning all the topics of the course has a duration of about 30 minutes. The evaluation is in thirtieths:          Excellent 30 - 30 and praise: Excellent knowledge of the topics, excellent properties of language, good analytical skills, the student is able to apply the knowledge to solve the proposed problems,          Very good 26 - 29: Good command of the subjects, full ownership of</p>

	<p>language, the student is able to apply the knowledge to solve the problems proposed problems.</p> <p>Good 24 - 25: Basic knowledge of the main topics, good property of language, with limited ability to autonomously apply knowledge to solve the proposed problems.</p> <p>Satisfactory 21 - 23: Does not have full mastery of the main topics of teaching but has the knowledge, satisfying properties of language, poor ability to autonomously apply knowledge acquired.</p> <p>Sufficient 18 - 20: Minimum basic knowledge of the main topics of teaching and technical language, very little or no ability to apply the acquired knowledge independently.</p> <p>Insufficient: Does not possess an acceptable knowledge of the contents of topics covered in teaching</p>
<b>EDUCATIONAL OBJECTIVES</b>	The suitable knowledge of the methodological-operational aspects related to energy management problems and the ability to use this knowledge to interpret and describe the practical problems concerning the rational use of energy.
<b>TEACHING METHODS</b>	Frontal lessons. Application or numerical examples will be developed within lessons
<b>SUGGESTED BIBLIOGRAPHY</b>	<p>Appunti del Prof. Antonio Piacentino</p> <p>World Oil and Gas Review 2014 Eni</p> <p>Progettare e gestire l'efficienza energetica - Beretta, De Carlo, Introna, Saccardi - McGraw-Hill 2012, ISBN-13: 978-8838667718</p> <p>Energy Management: Fondamenti per la valutazione, la pianificazione ed il controllo dell'efficienza energetica. Nino Di Franco - Franco Angeli Editore, 2015, ISBN-13: 978-8891714633</p>

## SYLLABUS

Hrs	Frontal teaching
3	Uses of energy and classification of sources. Macro-energy indicators
8	National and global data on the use of fossil and renewable sources - Quality of fuels and analysis of gas sector infrastructures
5	Energy prices on international markets: spot and futures markets
6	Economic evaluation of plant alternatives in energy systems - Ordinary and cash flows Differentials, Economic performance indicators, notes on interest and inflation rates
5	International gas supply: non-discriminatory access by third parties to essential infrastructures, characteristics of international supply contracts and barriers to competition
3	Energy balances
4	Electricity production infrastructure and generation cost components - electricity national demand and related characteristics
12	National electricity system, infrastructural aspects, free energy market
10	White Certificates, overview of CIP incentive 6/92 and Green Certificates, self-production of electricity and Dedicated withdrawal, system charges on electric bills
7	Energy auditing of civil and industrial users - Demand profiles and cumulative curves
9	Technologies for the production of hot and cold thermal fluids: comparison between plant solutions alternatives, energy performance indicators, design and management criteria for rational use energy
9	Combined production of heat, power and cooling