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Thessaloniki, 15/1/2026
No. Protocol No.: 38743

SUBJECT: Approval of the establishment and Internal Regulation of the **Joint Undergraduate Program of Studies in English (JEUPS)** Bachelor of Science in Clean Energy Science and Engineering of the Schools of Mechanical Engineering of the Faculty of Engineering (accelerated), Chemistry of the Faculty of Sciences and Agriculture of the Faculty of Agriculture, Forestry and Natural Environment of the Aristotle University of Thessaloniki (AUTH)

REF.: The document no. 37339/12-1-2026, of the Department of Mechanical Engineering of the Aristotle University of Thessaloniki with its attachments.

TO
The Quality Assurance Unit of the Aristotle University of Thessaloniki.

NOTIFICATION
(with attached documents)

- School of Mechanical Engineering
- School of Chemistry
- School of Agriculture of the Aristotle University of Thessaloniki

The Senate of the Aristotle University of Thessaloniki at its meeting number 3175/14-1-2026, having regard to:

1. The provisions of Law 3341/1925 (Government Gazette 154/vol. A΄/22-6-1925) "On the establishment of a University in Thessaloniki", which established the Aristotle University of Thessaloniki as the "University of Thessaloniki", as it was renamed to "Aristotle University of Thessaloniki" by article 7 of Law 3108/1954 (Government Gazette 314/vol. A΄/30-12-1954).

2. The provisions of the Presidential Decree 98/2013 (Government Gazette 134/vol. A΄/5-6-2013, correction of an error in the Government Gazette 140/vol. A΄/11-6-2013) "Abolition of the General Department, transfer of the seat of the department and establishment-formation, renaming and reconstruction of Faculties at the Aristotle University of Thessaloniki".

3. The provisions of articles 75-83 of Law 4727/2020 (Government Gazette 184/t.A΄/23-9-2020)

"Digital Governance (Incorporation of Directive (EU) 2016/2102 and Directive (EU) 2019/1024 into Greek Legislation) - Electronic Communications (Incorporation of Directive (EU) 2018/1972 into Greek Law) and other provisions".

4. The provisions of article 16 and Chapters G and K' of Law 4957/2022 (Government Gazette 141/t.A΄/21-7-2022) "New Horizons in Higher Education Institutions: Strengthening the quality, functionality and connection of HEIs with society and other provisions", as amended and in force.

5. The provisions of articles 14 and 15 of Law 3374/2005 (Government Gazette 189/vol. A΄/2-8-2005) "Quality assurance in higher education. System for the transfer and accumulation of credits - Diploma Supplement", as in force.
6. The provisions of the Ministerial Decision with number Φ5/89656/Β3/13-8-2007 (Government Gazette 1466/τ.Β΄/13-8-2007) "Implementation of the System for the Transfer and Accumulation of Credit Units".
7. The Ascertaining Act No. 26770/24-11-2023 of the Rector of the Aristotle University of Thessaloniki (Government Gazette 1287/t.Y.O.D.D./29-11-2023), on the formation of the Governing Council of the Aristotle University of Thessaloniki.
8. The number 75140/11-6-2025 (Government Gazette 680/t.Y.O.D.D.D./12-6-2025) Declaratory Act of the acting Rector of the Aristotle University of Thessaloniki, on the election of Kyriakos Anastasiades of Iraklis, Professor of the Department of Medicine of the School of Health Sciences, as Rector of the Aristotle University of Thessaloniki.
9. The decision of the Board of Directors of the Aristotle University of Thessaloniki with number 77939/23-6-2025 (Government Gazette 718/t.Y.O.D.D.D./23-6-2025) on the appointment of four (4) Vice-Rectors of the Aristotle University of Thessaloniki, based on par. 2 of article 12 of Law 4957/2022.
10. The decision of the Board of Directors of the Aristotle University of Thessaloniki with number 79214/26-6-2025 (Government Gazette 755/t.Y.O.D.D.D./27-6-2025) regarding the acceptance of the resignation of Eleftheria Thanouli, son of Dimitrios, Professor of the Film Department of the School of Fine Arts, from the position of Vice-Rector of the Aristotle University of Thessaloniki.
11. The decision of the Rector of the Aristotle University of Thessaloniki with number 79632/27-6-2025 (Government Gazette 3336/τ.Β΄/30-6-2025), on the determination of the areas of responsibility of the Vice-Rectors and the responsibilities transferred to them, based on Law 4957/2022 (par. 3 of article 12) and determination of the order of replacement of the Rector, by the Vice-Rectors, when he is absent or prevented from exercising his duties, based on Law 4957/2022 (par. 2 of article 15).
12. The Ascertaining Act of the Rector of the Aristotle University of Thessaloniki with number 300/1-9-2025 (ADA: 624146Ψ8XB-2KY) on the formation of the Senate of the Aristotle University of Thessaloniki for the academic year 2025-2026 and the Ascertaining Act of the Rector of the Aristotle University of Thessaloniki for the academic year 2025-2025 (ADA: 91XI46Ψ8XB- 5PSI) on the reconstitution of the Senate of the Aristotle University of Thessaloniki for the academic year 2025-2026.
13. The recommendations of the Assemblies of the Schools of Mechanical Engineering (meeting number 16/22-12-2025), Chemistry (meeting number 886/9-1-2026) and Agriculture (meeting number 1043/8-1-2026) of the Aristotle University of Thessaloniki regarding the establishment of the Interdepartmental Foreign Language Program for Undergraduate Studies (D.X.P.P.S.) entitled "Bachelor of Science in Clean Energy Science and Engineering", with attached the Feasibility Study, the Sustainability Report, the Budget Analysis based on student admission forecasts per year, the Special Cooperation Protocol between the collaborating Schools and the Internal Regulation of the JEUPS

14. The fact that the provisions of this decision do not cause any expenditure at the expense of the State Budget.

15. The fact that the provisions of this decision do not relate to an administrative procedure for which there is an obligation to register in the EIDD-MITOS, **decides:**

A. The establishment and operation, as of the academic year 2026-2027, of the **Joint Undergraduate Program of Studies in English (JEUPS)** entitled Bachelor of Science in Clean Energy Science and Engineering of the Schools of (i) Mechanical Engineering of the Faculty of Engineering (accelerated), (ii) Chemistry of the Faculty of Sciences and (iii) Agriculture of the School of Agriculture, Forestry & Natural Environment of the Aristotle University of Thessaloniki, in accordance with the provisions of Law 4957/2022, as in force, as follows:

Article 1

Title, Content and Purpose of the Program

The Schools of (i) Mechanical Engineering of the Faculty of Engineering (accelerating), (ii) Chemistry of the School of Sciences and (iii) Agriculture of the School of Agriculture, Forestry and Natural Environment of the Aristotle University of Thessaloniki, jointly organize and operate an Joint Undergraduate Program of Studies in English (JEUPS) (hereinafter referred to as the JEUPS) of the first cycle on Science and Engineering Studies in Clean Energy (Clean Energy Science and Engineering), which are full four-year studies and culminate in the award of a Bachelor of Science in Clean Energy Science and Engineering.

The subject of the Joint Undergraduate Program of Studies in English (JEUPS) is education in Clean Energy Science and Technology, combining basic and applied knowledge to acquire skills in the design and study of clean energy production and use systems and zero carbon footprint technologies.

The purpose of the Program is to provide interdisciplinary training in the principles, processes and technologies that determine the transition towards clean energy forms. It integrates knowledge from Chemistry, Engineering, and Environmental Sciences, focusing on energy materials, energy conversion and storage systems (solar, electrochemical, bioenergy), as well as the sustainable production and use of hydrogen. The program aims to shape graduates with scientific competence, technical ability and ecological awareness, capable of contributing to the global energy transition.

Learning outcomes and qualifications. With the successful completion of the JEUPS Clean Energy Science and Engineering, students will have acquired:

- Understanding Fundamental concepts of physics, chemistry, mathematics, statistics, technical engineering, and data processing.
- Familiarity with the subjects of energy processes, electrical and mechanical energy devices and computer programming.
- Supervision in the fields of energy technology, electrochemistry, energy materials, biochemical processes and sustainable design, as well as knowledge of writing and presenting a technical report, while through relevant work they will have deepened in relevant technological and scientific subjects of clean energy applications.

- Ability to continue studies in the second cycle of studies, as well as access, under certain conditions, to related professions in Greece and abroad.

The program provides students with the academic prerequisites for the continuation of their studies at postgraduate and then doctoral level and the professional prerequisites for their careers in fields that require documented technological and scientific knowledge, while the degree awarded is equivalent to the degrees awarded by corresponding BSc degrees from foreign universities.

Article 2

Degree

The JEUPS of the Schools of Mechanical Engineering, Chemistry and Agriculture of the Aristotle University of Thessaloniki awards a **Bachelor of Science degree in Clean Energy Science and Engineering**.

The successful completion of studies corresponds to level six (6) of the National and European Qualifications Framework, in accordance with the provisions of article 47 of Law 4763/2020 (Government Gazette A' 254).

Article 3

Number of Admissions – Selection Criteria and Required Supporting Documents

The **annual number of admissions** to the JEUPS Clean Energy Science and Engineering is set **at a maximum of forty (40)** legally eligible undergraduate students, while the minimum number of admitted students for the operation of the JEUPS is set at twenty-two (22) undergraduate students.

Upon the recommendation of the Curriculum Committee and the decision of the Senate, the minimum and maximum number of admissions may be changed in each cycle of the Program.

The **selection** of entrants is made on the basis of the candidates' curriculum vitae after evaluation of the file and supporting documents by the Curriculum Committee and the participation of the candidates in the selection process. This includes an oral interview conducted online by members of the Committee and assesses communication and thought documentation skills, academic and personal readiness, and general understanding of the subjects of the sciences of the Physics, Chemistry, Mathematics and English. By decision of the Curriculum Committee, which is mentioned in the announcement, a knowledge test may be carried out in English before the interview in the form and on topics that will be determined each time by the said decision.

The individual selection criteria, the required supporting documents and the selection procedure are set out in Article 5 of the Internal Regulation of the JEUPS

Article 4

Program Resources-Tuition Fees

The resources of the JEUPS Clean Energy Science and Engineering may come from:

- tuition fees,
- donations, sponsorships and all kinds of financial support,
- bequests,
- resources from research projects or programmes, in particular those of the European Union,
- own resources of the Aristotle University of Thessaloniki, the amount of which cannot exceed five percent (5%) of the total budget of the JEUPS and
- resources from any other legitimate cause.

A total tuition fee of thirty-two thousand euros (€32,000) is paid for attendance at the D.X.P.P.S. The tuition fees that each student is expected to pay amounts to eight thousand euros (€8,000) per year. The payment of the tuition fees is made by the students themselves (or by a third natural or legal person on his/her behalf) in eight (8) equal installments of the four thousand euros (€4,000): The first installment is paid during the student's enrollment process in the Program and the next installments before the start of each semester.

Article 5

Budget of the Programme

The management of the resources of the JEUPS Clean Energy Science and Engineering is carried out by the Curriculum Committee through the Special Account for Research Funds (E.L.K.E.) of the Aristotle University of Thessaloniki and are allocated as a matter of priority to meet the operational needs of the JEUPS and, if there are cash available, these may be allocated to cover other educational and developmental needs of the Schools of Mechanical Engineering of the Faculty of Engineering, the Department of Chemistry of the Faculty of Sciences, and the Department of Agriculture of the Faculty of Agriculture, Forestry & Natural Environment, in percentages corresponding to the educational load of each Department (48.7%, 38.1% and 13.7% respectively for the first cycle of the program for 4 years).

Out of a total of forty (40) admitted students per year, the revenues are analyzed as follows: 40 students ΄ 8 000 € per student, total tuition fees = 320,000 € in the first year of operation of the Program, i.e. 1,280,000 € from the fourth year of operation. and in the perspective of a four-year study cycle, the relevant distribution and analysis of expenses is as follows: a) Teachers' fees of €56,277 (€256,854 from the fourth year of operation), b) Supply of educational material and books of €10,000 (increased by €5,000 each following year), c) Cost of administrative support of the program €22,000 (with a provision for €44,000 € from the third year onwards), d) € 30,000 for the promotion and communication needs of the program, e) supply of consumables and f) transportation of

€ 5,000 (up to the amount of € 20,000 during the fourth year of operation) and g) provision of ten percent (10%) of the total for unforeseen expenses.

Finally, for the operation of the program, 100% of the category of scholarships, human resources, infrastructure and digitization is committed to the creation of a cash reserve in the first year and 20% from the second year onwards. The rest of the category from the raising of cash reserves, which amount to more than thirty-eight percent (38%) of revenues already from the second year and are maintained at a correspondingly high level during the fourth year of operation of the Program, the improvement of the infrastructure and equipment of the Schools of Mechanical Engineering, Chemistry and Agriculture, the digitization actions, the strengthening of human resources and the creation of a scholarship program are foreseen: a) to students of the Greek-language Undergraduate Programs of the Collaborating Schools on the basis of financial criteria, b) a program of excellence scholarships for research for graduates of the Greek-language Undergraduate Programs and c) a program of excellence scholarships for students of the JEUPS This program starts from the amount of € 323,446 already from the second year of its operation and may exceed € 600,000 at the end of the four-year period.

Article 6

Duration and Terms of Study

The duration of study at the JEUPS Clean Energy Science and Engineering is defined as eight (8) teaching semesters, full-time. The maximum duration of study is defined as this time, increased by four (4) academic semesters.

The program of each semester course lasts thirteen (13) weeks. The teaching of the courses is carried out in person, utilizing the infrastructure of the Schools of Mechanical Engineering, Chemistry and Agriculture, with the provision of the exceptional use of synchronous distance learning methods.

The rights and obligations of students are described in Articles 6 and 7 of the Internal Regulation of the Program.

Article 7

Official Language of Organization and Curriculum of JEUPS

The official language of the Program is English.

The Joint Undergraduate Program of Studies in English (JEUPS) "Clean Energy Science and Engineering" offers a single study program, full-time, lasting **four (4)** academic years, which is structured in **eight (8) academic** semesters. The program includes thirty-four (34) courses in total, with twenty-seven (27) compulsory courses and three (3) directions, each of which has three (3) compulsory courses, two (2) elective courses and two (2) compulsory semester assignments.

Compulsory courses (M). The student is required to attend and be successfully examined in twenty-seven (27) compulsory courses, of which he/she will accumulate one hundred and eighty (180) credits (ECTS) during his/her studies. The compulsory courses aim to give the student the fundamental knowledge and methodology of the subjects that traditionally make up the core of Clean Energy Science.

Elective Courses (E). Three (3) specialization directions (Plants Design, Clean Energy Applications, Smart Systems) are offered, of which the student should choose to attend five (5) courses during the seventh (7th) and eighth (8th) semesters of study and prepare two (2) compulsory assignments, related to the elective direction, one in each semester. Out of the five (5) courses, Three (3) are compulsory in the specialization and two (2) are selected from a list of free courses. Upon successful examination in his/her courses and assignments, the student accumulates a total of two hundred and forty (240) ECTS credits during his/her studies. The elective courses (E) aim to introduce the student, of his/her choice, to the logic of more specific subjects.

Attendance of courses is mandatory, while absences exceeding thirty percent (30%) of the teaching hours of each semester are not allowed, unless there are documented reasons of force majeure.

The academic year is structured in two (2) semesters (winter and spring), each of which contains thirteen (13) weeks of teaching, with an examination period at the end of each semester. The successful completion of studies for the award of the degree requires the accumulation of two hundred and forty (240) ECTS credits.

The language of instruction of all courses is English. Interested students have the opportunity to enroll in the School of Modern Greek Language of the Aristotle University of Thessaloniki, in order to learn Greek during the first three (3) years of study.

The program does not provide for compulsory internships.

The detailed curriculum is presented in Article 8 of the Internal Regulation of the Programme.

Internal Regulation of the Joint Undergraduate Program of Studies in English (JEUPS) (JEUPS) entitled Clean Energy Science and Engineering, of the Schools of Mechanical Engineering, Chemistry and Agriculture of the Aristotle University of Thessaloniki

Preamble

The first cycle of studies includes the attendance of an Undergraduate Studies Program (P.P.S.) and is completed with the award of an Undergraduate degree. Successful completion of the program leads to the award of a level six (6) degree, according to the National and European Qualifications Framework, i.e. the basic university degree (Bachelor of Science in Clean Energy Science and Engineering).

This Regulation of Undergraduate Studies is drafted in accordance with the provisions of Chapter G' of Law 4957/2022 (Government Gazette A', 141/21.07.2022) "New Horizons in Higher Education Institutions: Strengthening the quality, functionality and connection of HEIs with society and other provisions"**, which concern the organization and operation of study programs, as well as Chapter K' of the same law, which specifically concerns Foreign Language Undergraduate Study Programs. In addition, it is harmonized with the Regulation of Operation of Undergraduate Study Programs of the Aristotle University of Thessaloniki, ensuring that the regulations herein are in line with the current institutional framework of the institution.**

Article 1
Object, Purpose of the JEUPS

The Schools of (i) Mechanical Engineering of the Faculty of Engineering (accelerating), (ii) Chemistry of the School of Sciences and (iii) Agriculture of the School of Agriculture, Forestry and Natural Environment of the Aristotle University of Thessaloniki, jointly organize and operate an Joint Undergraduate Program of Studies in English (JEUPS) (hereinafter referred to as the JEUPS) of the first cycle on Science and Engineering Studies in Clean Energy (Clean Energy Science and Engineering), which are full four-year studies and culminate in the award of a Bachelor of Science in Clean Energy Science and Engineering.

The subject of the Foreign Language Undergraduate Program is education in Clean Energy Science and Technology, combining basic and applied knowledge to acquire skills in the design and study of clean energy production and use systems and zero carbon footprint technologies.

The purpose of the Program is to provide interdisciplinary training in the principles, processes and technologies that determine the transition towards clean energy forms. It integrates knowledge from Chemistry, Engineering, and Environmental Sciences, focusing on energy materials, energy conversion and storage systems (solar, electrochemical, bioenergy), as well as the sustainable production and use of hydrogen. The program aims to shape graduates with scientific competence, technical ability and ecological awareness, capable of contributing to the global energy transition.

Learning outcomes and qualifications. With the successful completion of the JEUPS Clean Energy Science and Engineering, students will have acquired:

- Understanding Fundamental concepts of physics, chemistry, mathematics, statistics, technical engineering, and data processing.
- Familiarity with the subjects of energy processes, electrical and mechanical energy devices and computer programming.
- Supervision in the fields of energy technology, electrochemistry, energy materials, biochemical processes and sustainable design, as well as knowledge of writing and presenting a technical report, while through relevant work they will have deepened in relevant technological and scientific subjects of clean energy applications.
- Ability to continue studies in the second cycle of studies, as well as access, under certain conditions, to related professions in Greece and abroad.

The program provides students with the academic prerequisites for the continuation of their studies at postgraduate and then doctoral level and the professional prerequisites for their careers in fields that require documented technological and scientific knowledge, while the degree awarded is equivalent to the degrees awarded by corresponding BSc degrees from foreign universities.

Article 2
Awarded Title of JEUPS

The JEUPS of the Schools of Mechanical Engineering, Chemistry and Agriculture of the Aristotle University of Thessaloniki awards a **BSc in Clean Energy Science and Engineering**.

The successful completion of studies corresponds to level six (6) of the National and European Qualifications Framework, in accordance with the provisions of article 47 of Law 4763/2020 (Government Gazette A' 254).

Article 3
Bodies of the JEUPS

The bodies responsible for the organization, administration and operation of the Interdepartmental Foreign Language Undergraduate Study Program Clean Energy Science and Engineering are the following:

α. The Senate of the Aristotle University of Thessaloniki
β. The Curriculum Committee of the JEUPS Clean Energy Science and Engineering
γ. The Director of JEUPS Clean Energy Science and Engineering
δ. The Assemblies of the three Collaborating Schools, which undertake to organize the JEUPS

More specifically:

1. The Senate of the Foundation exercises the following responsibilities:

α. Approves the establishment of the JEUPS, following the recommendation of the Assemblies of the Collaborating Schools, as well as the amendment of the decision for the establishment of JEUPS, following the recommendation of the Curriculum Committee.

β. Approves the Internal Regulation of the JEUPS, following the recommendation of the Assemblies of the Collaborating Schools, as well as its amendment, following the recommendation of the Study Program Committee.

γ. Establishes the Curriculum Committee of the JEUPS and appoints the Director of the JEUPS, following the recommendation of the Assemblies of the Collaborating Schools.

δ. Approves the abolition of the JEUPS, following the recommendation of the Assemblies of the Collaborating Schools.

ε. Exercises any other responsibility related to issues of academic, administrative, financial and organizational nature of the JEUPS, which are not specifically assigned by the present to other bodies.

2. The Curriculum Committee of the JEUPS Clean Energy Science and Engineering consists of seven (7) members of the Teaching Research Staff (D.E.P.) of the Participating Schools, of which at least two (2) faculty members are of the rank of Professor or Associate Professor. Four (4) members of the committee come from the Department of Mechanical Engineering, two (2) members from the Department of Chemistry and one (1) member from the Department of Agriculture. The Committee has a four-year term of office and is formed by decision of the Senate of the HEI, following the recommendation of the Assemblies of the Participating Schools, each of which is proposed by the members coming from the relevant Department. The members of the Commission shall not receive any allowance for the performance of their administrative duties. The Curriculum Committee of the JEUPS exercises the following responsibilities:

α. Proposes to the Senate the amendment of the decision establishing the JEUPS, as well as any other issue related to its operation, for which the Senate is the competent body

β. Distributes the teaching work among the teachers of the JEUPS

γ. Prepares the annual budget of the JEUPS

δ. Approves all expenses for the operation of the D.A.P.P.P.S.

ε. Ascertains the successful completion of the studies, in order to be awarded the title of JEUPS

στ. Exercises any other responsibility, which is related to the organization, administration and management of the JEUPS program.

g.The Coordinator may appoint **a Coordinator** of the JEUPS for a period equal to the term of office of the committee. The Coordinator is a faculty member of one of the Collaborating Schools and cooperates closely with the Director of the Program and the Committee, undertaking coordinating and organizational duties under their supervision. The Coordinator exercises, indicatively, the following responsibilities, as assigned by the Curriculum Committee:

g.1. Monitors the smooth day-to-day operation of the Program and ensures the timely implementation of the decisions of the Committee and the Director.

g.2. He is in charge of the organization of the timetable and the communication with the teachers.

g.3. Collaborates with the Secretariat on issues related to the operation of the Program.

g.4. Ensures that students are informed about the curriculum, evaluation procedures, mobility, scholarship opportunities and any other academic or administrative issue.

g.5. In coordination with the Programme Secretariat, it prepares and regularly reports to the Committee and the Director on the operation of the Programme.

g.6. Represents, following a relevant decision of the Committee or the Director, the Program in administrative and/or academic contacts with institutions inside and outside the Aristotle University of Thessaloniki.

g.7. Exercises, upon authorization of the Committee, any other competence assigned to the Director by these Regulations.

3. The Director of the D.A.P.P.P.S. is an accelerating professor of the Department of Mechanical Engineering appointed by the Curriculum Committee of the JEUPS The Director exercises, indicatively, the following responsibilities:

α. He chairs the Curriculum Committee and convenes its meetings.

β. Proposes to the Curriculum Committee and the other bodies of the HEI issues related to the effective operation of the JEUPS

γ. He is the Scientific Coordinator of the JEUPS, in accordance with article 234 of Law 4957/2022.

Article 4
Categories of Candidates in JEUPS

Foreign candidates are eligible to apply, who are:

(a) Graduates of lyceums or equivalent schools with physical headquarters abroad. Interested parties, if they have attended the last two (2) grades of high school or equivalent school in a foreign country with full attendance, must present a high school diploma or other equivalent secondary education title, which gives them the right to admission to higher education institutions in the country in which they graduate.

b) Graduates of a recognized foreign school of other Member States of the European Union or of third countries, which is legally established and operates in the country, the title of which entitles them to admission to higher education institutions based in the country whose educational curriculum follows the said foreign graduating school, provided that:

(ba) they and their parents do not have Greek citizenship and

(bb) have attended at least the last two (2) grades of Lyceum on a full-time basis.

(c) Students of higher education institutions abroad with a positive direction, who hold the certificate of par. 1 of article 314A of law 4957/2022, in order to continue their studies in a corresponding semester and to be awarded a degree by the D.X.P.P.S. Clean Energy Science and Engineering.

Foreign schools in Greece must be recognized for their legality of operation by the locally competent Directorate of Secondary Education.

The method of checking the authenticity of the high school diploma and the detailed grade of the candidate can be carried out:

α. with the Hague stamp (APOSTILLE), if the country of origin of the documents is a member of the Convention on the Apostille of the Hague Stamp,

β. with a notarial endorsement (notarial deed),

γ. with validation by the Ministry of Foreign Affairs and/or the Ministry of Education of the issuing country,

δ. by submitting the graduation certificate and/or the detailed grade and at the same time informing the foreign school by the interested party. The information is accompanied by an official email from the foreign school, giving the Program Secretariat the opportunity to check the authenticity of the documents in question.

Proof of English language proficiency

Candidates must demonstrate proficiency in English at least level B2, in accordance with the Common European Framework of Reference (CEFR), in one of the following ways:

α. Mother tongue English.

β. Possession of a language certificate of at least B2 level from a recognized examination body, in accordance with the applicable decisions of the Supreme Council for Civil Personnel Selection (ASEP) or the Ministry of Education on recognized language qualifications.

γ. Degree from the Department of Foreign Language and Literature or the Department of Foreign Languages, Translation and Interpreting of the country, or an equivalent degree from a recognized institution abroad.

δ. Bachelor's / Master's / Doctoral degree from a recognized foreign university, as long as the program is conducted entirely in English.

ε. A high school leaving certificate, provided that the candidate has attended at least the last two (2) years of secondary education in a school with English as the official language of instruction.

στ. A foreign language teaching proficiency permit does not constitute proof of knowledge of this language, as it requires the presentation of a certified degree on the basis of which the license was issued, as well as an official translation, if required.

Article 5
Number of Admissions, Selection Criteria and Required Supporting Documents

The **annual number of admissions** to the JEUPS Clean Energy Science and Engineering is set **at a maximum of forty (40)** undergraduate students, while the minimum number of admitted students for the operation of the JEUPS is set at twenty-two (22) undergraduate students. By decision of the Study Program Committee, the

minimum and maximum number of admissions may be changed in each cycle of the Program.

In case of a tie between the candidates, the candidates who are tied with the last successful candidate, according to their ranking **and until the maximum number (forty) is reached**, are admitted to the JEUPS

The **selection** of admissions is made on the basis of the candidates' CV after evaluation of the file and supporting documents by the Curriculum Committee and the participation of the candidates in the selection process. This includes an oral interview conducted online by members of the Committee and assesses communication and thought documentation skills, academic and personal readiness, general understanding of physics issues, Chemistry and Mathematics. By decision of the Curriculum Committee, which is mentioned in the announcement, a knowledge test may be carried out in English before the interview in the form and on topics that will be determined each time by the said decision.

Applications are submitted electronically throughout the year and until a date to be announced annually during the operation of the program. Candidates are invited to submit their applications accompanied by the necessary supporting documents to the Secretariat of the Program in electronic form. In case the Curriculum Committee decides to conduct a knowledge test in English, the announcement specifies the examination dates as well as the subject areas. The English language proficiency test and interviews are conducted on predetermined dates set by the Curriculum Committee, while the evaluation order follows the chronological order of receipt of applications. The relevant announcement and the corresponding required supporting documents are published at a reasonable time before the completion of the process on the Program's website.

The candidate submits the following **supporting documents**:

- Application for participation in the JEUPS available in electronic form on the Program's website
- Photocopy of two sides **of the Police ID Card** or **Passport**
- **High school diploma** (with official translation into English)
- **Detailed grades** of all subjects of the last year of high school (with official translation into English), where they must show that they have been successfully examined in Mathematics, Physics and Chemistry courses or as respectively described in the relevant certificate (baccalaureate).
- Certificate of English language proficiency at least level **B2**
- **Motivation Letter** of up to five hundred (500) words, which presents the candidate's interest in science, motivation for studying in the program, and future goals
- **A short curriculum** vitae (in English) that includes details of studies, distinctions, volunteering or other activities related to the subject.

The above described criteria for the selection of candidates and supporting documents may be amended following a proposal by the Study Program Committee and approval by the Senate of the Aristotle University of Thessaloniki.

In addition, the following optional academic criteria are positively counted in the evaluation of the candidate's file:

- Minimum overall baccalaureate grade: **seventy percent (70%) of the maximum grade** or equivalent
- Possession of admission tests in higher education, such as:
  - *International Baccalaureate **(IB)**:* ≥23/45,
  - *SAT / ACT*: **SAT**: ≥ 1200/1600 | **ACT**: ≥ 25/36,
  - *TSA (Thinking Skills Assessment):* ≥ 60/100 or raw score ≥ 25/50

For the evaluation and selection of candidates, additional criteria are taken into account, which are defined and may be reformed following the recommendation of the Curriculum Committee and in accordance with the applicable legal framework.

The relevant original documents, if deemed necessary, may be requested by the candidate to be sent by post or submitted in person to the Secretariat of the Program.

The **final selection process of candidates** for the Program is carried out by the Study Program Committee, as follows: The Committee compiles a complete list of all candidates and, after the relevant check, rejects those who do not meet the minimum criteria set by the Law and the Program and invites to an interview the qualified candidates who have collected the required supporting documents. After the completion of the process (evaluation based on the supporting documents, the interview and the knowledge test – if any), the final list of successful candidates is drawn up.

The **final list of successful candidates** and any runners-up is validated by the Study Programme Committee. The selection process, the publication of the results and the registration of the successful candidates must be completed by September 30 of each academic year, subject to the filling of vacancies created by students who voluntarily left the Program by interrupting their studies. from the list of runners-up drawn up by the Curriculum Committee during the evaluation of applications.

In addition to and in addition to the above, students of foreign higher education institutions, who hold a certificate of evaluation of periods of study, which have been completed in a recognized higher education institution abroad (par. 1 of article 314A of law 4957/2022 as amended by article 128 of Law 5094/2024), are offered the opportunity to enroll in the JEUPS Clean Energy Science and Engineering of the Aristotle University of Thessaloniki, in order to continue their studies and be awarded the corresponding degree.

The interested party submits an application with the required supporting documents to the Secretariat of the JEUPS in printed or electronic form, through the Electronic Registration Information System of the Ministry of Education, Religious Affairs and Sports.

Filling vacancies

In case of withdrawal or deletion of a student, the Study Program Committee may, by a specially reasoned decision, replace the vacant position, in order to ensure the smooth operation of the Program by maintaining a stable number of students in each year of study.

The position can be filled by students who are studying in the same or higher semester of studies in internationally recognized higher education institutions of foreign science.

The selection of candidates can be made either by candidates who had applied in the initial submission cycle, or through a separate public call.

Interested parties are invited to provide the following supporting documents:

- Copy of ID card or passport,
- High school diploma (original and official translation into English),
- Grades of all subjects of the last year of high school (original and official translation into English),
- Detailed grades from the School of origin, origin (in the cases of par. 1 of Art. 314A of Law 4957/2022),
- Official Curriculum of the School of origin to check academic correspondence (in the cases of par. 1 of Art. 314A of Law 4957/2022),
- Proof of English language proficiency in accordance with the relevant passage of Article 4 of this Regulation,
- Letter of expression of interest and
- Curriculum vitae.

The Committee evaluates the candidates' files and may invite an interview before the final decision is issued.

Objections to the results may be submitted within five (5) working days from the notification of the results, with a written request to the Secretariat of the JEUPS

The registration of the successful candidates takes place following a relevant announcement by the Secretariat of the JEUPS within fifteen (15) days, with the submission of any necessary supporting documents. In case a candidate does not register within the prescribed deadline by paying the relevant advance payment of the tuition fees, it is considered as a refusal to accept the position, which is covered by the next runner-up.

It is clarified that the applications and the possible acceptance of the candidates concern exclusively the academic year specified in the respective call for applications. There is no provision for provisional admission for subsequent academic semesters or years, regardless of the reason, including, but not limited to, military service or personal obligations. Candidates who wish to study in a later year, must submit a new application in the next cycle and the corresponding invitation.

Exceptionally, the Study Program Committee may, by reasoned decision, approve the postponement of the start of studies for one academic year, if there are serious reasons that are sufficiently documented by the interested candidate. The relevant decision on whether or not to grant the postponement is left exclusively to the discretion of the Committee.

Article 6
Duration and Terms of Study at the JEUPS

The duration of study at the JEUPS leading to the receipt of the Degree is set at **eight (8) teaching semesters**, full-time.

The program of each semester course lasts thirteen (13) weeks and is developed with lectures, assignments, etc., depending on the requirements of the course and the choice of each instructor.

All courses are held **in person** utilizing the infrastructure of the three Participating Schools. The exceptional use of **synchronous distance learning methods** is provided for the provision of teaching work carried out with the participation of Professors from foreign institutions or Collaborating Professors, in force majeure or extraordinary circumstances, where it is not possible to conduct the educational process in person or to use the infrastructure of the three Collaborating Schools for the conduct of its educational, research and other activities and for the organization of in-depth courses and tutorial exercises, in addition to the mandatory teaching hours per subject. The conduct of distance learning courses is done using ICT, utilizing the material and technical infrastructure of the three Participating Schools, as well as the know-how and support of the Digital Governance Unit (M.D.D.) of the Aristotle University of Thessaloniki.

The minimum duration of study at the JEUPS for the award of the degree is eight (8) academic semesters, while the maximum duration of study is defined as this time, increased by four (4) academic semesters.

After the completion of the maximum duration of twelve (12) semesters, and without prejudice to the provisions in force each time in accordance with the current legislation on HEIs, an act of expulsion of the student is issued by the competent body of the JEUPS

Once the registration has been completed and all the prescribed procedures concerning the formally guaranteed start of studies have been completed, students who have not exceeded the maximum attendance limit of par. 1, may apply for a break from studies for a period not exceeding a total of two (2) academic years. The right to interrupt studies may be exercised once or in parts for a period of at least one (1) academic semester, but the duration of the interruption may not exceed two (2) years cumulatively if it is granted in parts. Student status is suspended during the interruption of studies and participation in any educational process is not allowed. The time of interruption of studies is not counted in the maximum duration of regular study, while upon the resumption of studies, students return to a state of regular study with all the rights and obligations provided for in the Program. The relevant procedure is initiated by a written application of the interested student to the Secretariat of the JEUPS, accompanied by the necessary, as the case may be, documents and is evaluated by the Study Program Committee.

For serious health reasons attributable to the person of the student or to a person of a first-degree blood relative or spouse or person with whom the student has entered into a cohabitation agreement, the maximum duration of study that does not exceed one (1) year is exceptionally exceeded. This excess is approved by the Curriculum Committee,

following a fully justified and adequately documented application of the student, and cannot exceed two (2) consecutive academic semesters.

The JEUPS does not offer part-time study.

For issues of re-examination of courses in due courses or deletion for reasons such as:

(a) the insufficient progress of the student (which is documented by lack of participation in the educational process: attendance, examinations),

(b) the manifestation of behavior that offends academic ethics and

(c) application of the student himself/herself,

the Curriculum Committee decides.

Article 7
Student Rights and Obligations

In the context of the social policy of the Collaborating Schools, in collaboration with the Equal Access Unit of the Aristotle University of Thessaloniki, the full, equal and effective participation of all students with disabilities or special educational needs in all educational, research and administrative activities of the Schools in general and of the JEUPS in particular is ensured.

Access to the teaching and examination areas of the Collaborating Schools is facilitated through appropriate infrastructure, such as ramps, special bars and elevators. For students who, due to disability or learning difficulties, are unable to participate in written exams, it is possible to take an oral examination either in person in an accessible room or remotely through a digital teleconferencing platform.

Students enroll and participate in the JEUPS under the terms and conditions provided for in these Regulations. Students of the program have **all the rights**, benefits and facilities provided for students of the Greek-language study program **except** the right to provide free textbooks. Also, the meals at the University Student Club of the Aristotle University of Thessaloniki are made with the payment of a small fee, as determined by the respective operating regulations of the Club.

Students admitted to the JEUPS **must**:

1. Attend all courses of the Program of Study, regardless of whether they are conducted in person or, exceptionally, remotely, if the latter has been approved by the competent bodies of the Program. Participation in courses, exercises, examinations, public lectures and other educational activities is mandatory. are entitled to an absence of up to thirty percent (30%) of the total teaching hours of each course per semester. In case of serious and justified impediment, it is possible to make up for the teaching hours, after consultation with the instructor and with the approval of the Curriculum Committee.

2. To submit the required assignments on time, if they are provided for in each course by the teacher in charge.

3. To declare in time the courses of previous years that have not been successfully examined, at the beginning of each semester. The declarations are registered

electronically through the electronic secretariat service and are included in the student's individual account. Compulsory declaration is required in the last year for the elective courses.

4. To procure or borrow the necessary textbooks, based on the ones proposed by the person in charge of each course, if this is deemed necessary.

5. To systematically monitor the announcements of the Programme and the Secretariat, regularly checking their e-mails.

6. To issue an academic identity card through the competent electronic service of the Ministry of Education, Religious Affairs and Sports.

7. To pay the tuition fees on time before the winter and summer semesters of each academic year, in accordance with the deadlines set.

8. Have settled any financial or other pending issues to the Program and the Foundation before graduation. Otherwise, they do not have the right to participate in the ceremony of receiving their degree.

9. In the case of a scholarship of a contributory nature, to provide the planned work, which may concern the support of the educational or research operation of the Program, the library or other needs of the School.

10. To respect the decisions of the Program's bodies and to adhere to the rules of academic ethics.

Systematic or serious violation of the obligations arising from these Regulations, without sufficient and documented justification, may result in failure in a course, or, in serious cases, exclusion from educational activities and/or deletion of the student from the Program, following a decision of the Study Program Committee.

The same sanction may be imposed in cases of disciplinary offences, which offend the academic community and the dignity of its members, such as sexist, racist, homophobic or transphobic behaviour, verbal or physical violence, inappropriate behaviour in university premises, as well as any action contrary to the principles of respect, equality and inclusion. Finally, the Committee reserves the right to refer the relevant cases to the competent disciplinary bodies of the Foundation or, if there are reasons, to forward them to the competent authorities of the legal order, in accordance with the applicable legislation.

Article 8
Curriculum - Course Contents - Knowledge Testing

The Joint Undergraduate Program of Studies in English (JEUPS) of Study "Clean Energy Science and Engineering" offers a single study program, full-time, lasting **four (4)** academic years, which is structured in **eight (8) academic** semesters. The program includes thirty-four (34) courses in total, with twenty-seven (27) compulsory courses and three (3) directions, each of which has three (3) compulsory courses, two (2) elective courses and two (2) semester assignments.

Compulsory courses (M). The student is required to attend and be successfully examined in twenty-seven (27) compulsory courses, of which he/she will accumulate one hundred and eighty (180) credits (ECTS) during his/her studies. The compulsory courses aim to give the student the fundamental knowledge and methodology of the subjects that traditionally make up the core of Clean Energy Science.

Elective Courses (E). Three (3) specialization directions (Plants Design, Clean Energy Applications, Smart Systems) are offered, of which the student should choose to attend five (5) courses during the seventh (7th) and eighth (8th) semesters of study and prepare two (2) compulsory assignments, related to the elective direction, one in each semester. Out of the five (5) courses, Three (3) are compulsory in the specialization and two (2) are selected from a list of free courses. Upon successful examination in his/her courses and assignments, the student accumulates a total of two hundred and forty (240) ECTS units during his/her studies. The elective courses (E) aim to introduce the student, at his/her choice, to the logic of more specific subjects.

Teaching takes place in person, with provision for the use of digital support for educational material and communication between students and teachers through the e-learning platform of the Aristotle University of Thessaloniki. Attendance of courses is mandatory, while absences exceeding thirty percent (30%) of the teaching hours of each semester are not allowed, unless there are documented reasons of force majeure.

The academic year is structured in two (2) semesters (winter and spring), each of which contains thirteen (13) weeks of teaching, with an examination period at the end of each semester. Successful completion of studies requires the accumulation of two hundred and forty (240) ECTS credits.

The language of instruction of all courses is English. Students have access to optional courses of Greek terminology, especially during the fourth (4th) year, with the aim of facilitating those who wish to continue their professional career in Greece, as well as courses of special interest.

The program does not provide for compulsory internships, but it offers advisory support and opportunities to participate in research programs of a related subject, especially through targeted semester projects offered in the seventh and eighth semesters.

Curriculum

Course Code	CURRICULUM | Compulsory Courses - Mandatory Courses	Hours/week Hours/week	ECTS
	1st Semester -1st Semester	**18**	**30**
CESE01	Γενική Χημεία - General Chemistry	5	9
CESE02	Λογισμός – Calculus	4	6
CESE03	General Physics for Energy Materials Engineers	4	6
CESE04	Introduction to programming	5	9
	2nd Semester - 2nd Semester	**21**	**30**
CESE05	Τεχνική Μηχανική - Technical Mechanics	4	6
CESE06	Φυσική Χημεία Ενεργειακών Συστημάτων - Physical Chemistry for Energy Systems	5	7
CESE07	Γραμμική Άλγεβρα και εφαρμογές της - Linear Algebra and its Applications	4	6
CESE08	Ενεργειακοί Πόροι - Energy Resources	4	5
CESE09	Στατιστική – Statistics	4	6
	3rd Semester - 3rd Semester	**18**	**30**
CESE10	Ανάλυση και μοντελοποίηση δεδομένων - Data analytics and Modelling	5	8
CESE11	Thermomechanics of Fluids	4	7
CESE12	Επιστήμη και Μηχανική Υλικών - Materials Science and Engineering	5	8
CESE13	Ενεργειακά Συστήματα - Energy Systems	4	7

	4th Semester - 4th Semester	**21**	**30**

CESE14	Μηχανικός Σχεδιασμός και Ανάλυση - Engineering Design and Analysis	4	5
CESE15	Electrochemical Energy Storage Systems - Electrochemical Energy Storage	5	7
CESE16	Υπολογιστικές Μέθοδοι για την Προσομοίωση Ενεργειακών Υλικών - Computational Methods for Simulating Energy Materials	5	7
CESE17	Κυκλώματα και Ηλεκτρονικά - Circuitry and Electronics	5	6
CESE18	Βιομηχανική και Βιοτεχνολογία - Bioengineering and Biotechnology	4	5

	5th Semester - 5th Semester	**23**	**30**

CESE19	Sustainability Engineering and Circular Economy	4	5
CESE20	Ηλεκτρικές Μηχανές - Electrical Machines	5	5
CESE21	Καθαρή Καύση - Clean Combustion	4	6
CESE22	Βιοδιεργασίες για Παραγωγή Καθαρής Ενέργειας - Bioprocessing for Clean Energy Production	5	7
CESE23	Υπολογιστικές Προσεγγίσεις Ηλεκτρονικής Δομής για Υλικά σε Ενεργειακά Συστήματα - Electronic-Structure - Computational Approaches for Materials in Energy Systems	5	7

	6th Semester - 6th Semester	**18**	**30**

CESE24	Επαγγελματισμός μηχανικών - Engineering Professionalism	4	10
CESE25	Renewable Energy Sources - Renewable Energy Technologies	4	6

CESE26	Χημικές και Φυσικές Διεργασίες για την Παραγωγή Καθαρής Ενέργειας - Chemical and Physical Processes for Clean Energy Production	5	6
CESE27	Life Cycle Sustainability Assessment (LCSA)	5	8

Specialization Specialization 1: Design of Industrial Facilities - Module 1: Plant Design

	7th Semester - 7th Semester	**12**	**30**
CESEPD01	Industrial Process Design - Industrial Processes Design	4	6
CESEPD02	Επιχειρησιακή Έρευνα και Βελτιστοποίηση - Operations Research and Optimization	4	6
CESE0XEL	Μαθήματα επιλογής - Elective Course	4	6
CESE28	Technical Work - Senior Project		12
	8th Semester - 8th Semester	**8**	**30**
CESEPD03	Χρηματοοικονομική της Ενέργειας - Energy Finance	4	6
CESE0XEL	Μαθήματα Επιλογής - Elective Course	4	6
CESE29	Thesis - Capstone Project		18

Specialization Direction 2: Clean Energy Technologies - Module 2: Clean Energy Applications

		12	**30**
	7th Semester - 7th Semester		
CESECEA01	Heating Devices and Engines - Heat Devices and Engines	4	6
CESECEA02	Έλεγχος Ενεργειακών Συστημάτων - Energy Systems Control	4	6
CESE0XEL	Μαθήματα Επιλογής - Elective Course	4	6
CESE28	Technical Work - Senior Project		12
	8th Semester - 8th Semester	**8**	**30**
CESECEA03	Εφαρμογές στη Γεωργία - Applications in Agriculture	4	6

CESE0XEL	Μαθήματα Επιλογής - Elective Course	4	6
CESE29	Thesis - Capstone Project		18

Specialization Direction 3: Smart Systems - Module 3: Smart Systems **12** **30**

7th Semester - 7th Semester

CESESS01	Διανεμημένη Παραγωγή Ενέργειας - Distributed Energy Production	4	6
CESESS02	Υδρογόνο και Κυψέλες Καυσίμου - Hydrogen and Fuel Cells	4	6
CESE0XEL	Μαθήματα Επιλογής - Elective Course	4	6
CESE28	Technical Work - Senior Project		12

8th Semester - 8th Semester **8** **30**

CESESS03	Έξυπνα Δίκτυα - Smart Grids	4	6
CESE0XEL	Μαθήματα Επιλογής - Elective Course	4	6
CESE29	Thesis - Capstone Project		18

Μαθήματα Επιλογής κατευθύνσεων Εξειδίκευσης - Elective Courses for Modules

7th Semester - 7th Semester

CESE01EL	Ενεργειακά Συστήματα στα Κτίρια - Energy Systems in the Built Environment	4	6
CESE02EL	Ενέργεια και Περιβάλλον - Energy and Environment	4	6
CESE03EL	Στροβιλομηχανές - Turbomachines	4	6

8th Semester - 8th Semester

CESE04EL	Μοντελοποίηση και βελτιστοποίηση ενεργειακών συστημάτων - Modeling and Optimization of Energy Systems	4	6
CESE05EL	Battery Management in Electric Vehicles. - Battery Management in Electric Vehicles	4	6

CESE06EL	Ενέργεια από τη Χημική Ανακύκλωση Πλαστικών Αποβλήτων - Energy from the Chemical Recycling of Waste Plastics	4	6

Course content

A. COMPULSORY COURSES

A. MANDATORY COURSES

[CESE01] – General Chemistry

This course provides a comprehensive introduction to the fundamental principles of general chemistry, forming the scientific foundation for subsequent studies in clean energy science and engineering. The course integrates key concepts from inorganic, physical and organic chemistry, emphasizing the structure-property relationships that govern chemical behaviour in energy-relevant systems. Students are introduced to atomic structure, quantum concepts, periodic trends and chemical bonding, including ionic, covalent and metallic bonding, as well as molecular structure and intermolecular interactions. Basic solid-state concepts are presented, covering crystalline and amorphous materials, bonding in solids and phase transitions. The physical chemistry component introduces states of matter, gas behaviour, phase equilibria, electrolyte solutions and fundamental spectroscopic techniques (IR, Raman, UV–Vis) used for molecular and materials characterization. Introductory organic chemistry topics include structure and bonding, stereochemistry, hydrocarbons, functional groups and aromatic systems, with emphasis on molecular structure and reactivity relevant to materials and energy-related applications. By the end of the course, students will have a solid understanding of the chemical principles underlying materials, reactions and processes that are central to clean energy technologies.

[CESE02] – Calculus

This course provides a concise and structured overview of the fundamental concepts of calculus, emphasizing on conceptual understanding, graphical interpretation and practical problem solving. The following is an outline of the course: Review of functions and graphs. Real functions of a single variable: Exponentials, Cyclic, hyperbolic and their inverses. Introduction of limits and continuity. Differential Calculus: Derivatives, derivatives as rate of change and applications in optimization and motion. Differentials and applications involving linear approximations. Tangent lines. Introduction to

sequences and series. Power series. Taylor polynomials and Taylor series. Integral Calculus: Definite and indefinite integrals. The Fundamental theorem of calculus. Improper integrals. Applications in area, curve length and volume of surfaces of revolution. Multivariable functions. Partial derivatives. The notion of gradient. Directional derivatives. Differentiability. Differentials and linear approximations, tangent planes and normal lines. Local and global extrema. Lagrange multipliers.

[CESE03] – Physics for Energy Materials Engineers

This course provides a comprehensive introduction to the core areas of physics required for further study in Clean Energy Science and Engineering. Beginning with mathematical tools and kinematics, the course develops a solid foundation in classical mechanics, including Newton's laws, force modelling, work and energy, momentum, collisions, rotational dynamics, and oscillatory motion. These topics establish the physical reasoning and problem-solving framework that underpins much of scientific and engineering analysis.

Building on this foundation, the course introduces the principles of electricity through electrostatics, electric fields, electric potential, and capacitors. Students learn how electric circuits operate through the study of current, voltage, resistance, and basic circuit laws. A light introduction to magnetism and electromagnetic induction provides conceptual understanding of magnetic forces, magnetic fields generated by currents, and the qualitative meaning of Faraday's law. While magnetism is not treated in full depth, students gain the necessary insight to understand simple electromagnetic interactions and to prepare for more advanced courses in electromagnetism or energy systems.

Throughout the course, physical concepts are illustrated with examples, problem-solving exercises, and short applications relevant to scientific and engineering contexts. By the end of the semester, students will have developed a coherent understanding of the fundamental laws governing mechanical, electrical, and magnetic systems, forming a strong foundational platform for subsequent studies in energy engineering, materials science, thermodynamics, and modern physics.

[CESE04] – Introduction to programming

This course provides a comprehensive introduction to programming, focusing on Python as a modern, versatile, and open-source language widely used in science and technology. Students are trained to think algorithmically, design structured solutions, and implement them in Python. The course emphasizes clarity, reproducibility, and hands-on practice through interactive coding sessions and computer labs.

The content covers both fundamental programming concepts and their application to scientific problem-solving. Students begin with general knowledge about computers, operating systems, and programming languages, before progressing to Python syntax, data structures, and libraries. They learn how to design algorithms, write efficient code, and apply computational methods to analyze data, visualize results, and simulate scientific systems.

Special attention is given to the use of NumPy, Pandas, and Matplotlib, as well as Jupyter notebooks for interactive workflows. By combining lectures, labs, and projects, the course ensures that students acquire both theoretical understanding and practical skills.

[CESE05] – Technical Mechanics

This course is the foundation of engineering analysis, covering the principles of force systems on bodies. Focus on drawing Free-Body Diagrams, calculating Internal Forces (shear/moment) in structures, and analysing friction. The second part introduces Stress and Strain concepts to understand material deformation, elasticity, and structural integrity. Key topics include: Free Body Diagrams & Equilibrium: Modelling and balancing forces. Internal Forces: Axial/Shear force and bending moment calculations. Stress & Strain: Material response to load. Elasticity: Understanding material deformation and stiffness.

[CESE06] – Physical Chemistry for Energy Systems

This course introduces the essential principles of Physical Chemistry that govern the behaviour of chemical and electrochemical systems used in modern clean-energy technologies. Core topics include the thermodynamic properties of gases, liquids and solids; the First, Second and Third Laws of Thermodynamics; and chemical and phase equilibria in multicomponent systems relevant to energy processes. Students explore the properties of solutions and electrolytes, ionic activity, and introductory electrochemistry, with emphasis on electrochemical potentials and energy conversion. Fundamental concepts of chemical kinetics and catalysis are also covered, focusing on reaction rates, temperature effects and mechanisms central to combustion, electrolysis, hydrogen production and catalytic conversion pathways. Laboratory exercises introduce key experimental techniques for the characterization of physical and chemical behaviour, including calorimetry, conductivity measurements, equilibrium studies and basic electrochemical diagnostics.

[CESE07] – Linear Algebra and its Applications

This course introduces the fundamental principles of linear algebra in n-dimensions and its applications in energy systems. The main topics of the course are as follows:

- Elementary Matrix Theory
- Systems of simultaneous equations – Reduced row echelon form – Numerical implementation
- Linear algebra in n-dimensions – Vector spaces – bases – column and row space – null and range space – representation of lines and planes – Numerical implementation
- Orthogonality and its consequences – Orthogonal and orthonormal bases – projection to spaces – Numerical implementation
- Eigenvalue – eigenvector problem
- Quadratic forms

- Linear regression, simulation and optimization applications in Clean Energy Systems

[CESE08] – Energy Resources

Introduction to Energy Resources: Global energy demand, energy units, EROI, sustainability concepts, Fossil Fuels: Coal, oil, natural gas – reserves, extraction, processes, use, environmental impacts, Nuclear Energy: Fission, fusion prospects, safety, waste management, Hydropower: Large-scale dams, small hydro, pumped storage, Solar Energy: Photovoltaics, solar thermal, CSP, Wind Energy: Wind turbines, onshore, offshore, resource assessment, Biomass & Bioenergy: Thermochemical/Biochemical processes, biofuels, biogas, waste-to-energy, Geothermal Energy: Resource types, technologies, limitations, Marine Energy: Tidal, wave, ocean thermal, Energy Storage: Thermal storage, Electrochemical storage, batteries, hydrogen, P2X technologies, Energy Systems Integration: Smart grids, hybrid systems, Energy Economics & Policy: Cost analysis, subsidies, carbon pricing, Future Outlook & Review: Global energy transition scenarios.

[CESE09] – Statistics

This course introduces the fundamental concepts of probability and statistics used for data analysis and inference. Students learn to summarize and visualize data using descriptive statistics, frequency distributions, and histograms, and to quantify key characteristics such as central tendency and variability. The course covers core probability principles, including random variables, expected values, and major discrete and continuous probability distributions, along with the central limit theorem. Students then explore statistical estimation through sampling distributions, point estimators, confidence intervals, and sample-size determination. Building on these foundations, the course addresses hypothesis testing for parameters and goodness-of-fit, before concluding with an introduction to simple linear regression for modelling relationships in data.

[CESE10] – Data analytics and modelling

This course introduces the basic concepts of data analytics and modelling with the aid of Machine Learning, The course prepares students for careers in energy and environmental consulting, governmental agencies, research institutions, and technology companies focusing on clean energy. Graduates will be equipped to address complex clean energy challenges using data science and informatics approaches. Contents: Introduction to Energy and Environmental Data, Data Cleaning and Descriptive Statistics, Patterns and Trends identification & visualization, Introduction to Regression, Classification Methods, Time Series Forecasting, Pattern Recognition - Clustering and PCA, Neural Networks Introduction, Comparing Methods and Model Selection, Basics in information service design, Project Work Session: Apply learned methods to a chosen topic - Options: energy forecasting, consumption analysis, environmental prediction

[CESE11] – Thermofluids

This course presents a holistic approach in the main principles of energy technology.

In particular, the main principles of Thermodynamics, Fluid Mechanics and Heat Transfer are presented in this course.

1. Thermodynamics

The first principles of Thermodynamics including the First and Second Law of Thermodynamics are presented. The application of the related technologies are introduced using the worked out examples.

2. Fluid Mechanics

The first principles of Fluid Mechanics are introduced in this course. The conservation of mass, energy and momentum are presented in 0D, namely the Continuity Equation, the Bernoulli Equation and the Force-Momentum Equation.

3. Heat Transfer

The first principles of Heat Transfer are introduced in this course. The main concepts of heat transfer by convection, conduction and radiation are presented.

[CESE12] – Materials Science and Engineering

- What is Materials Science and Engineering: the materials paradigm and design trade-offs.
- Materials classes and typical applications; introduction to microstructure.
- Atomic bonding, crystal structures, and amorphous solids.
- Crystal defects: vacancies, dislocations, grain boundaries; diffusion basics.
- Phase diagrams: phases, lever rule, eutectic; intro to phase transformations.
- Mechanical behavior: elastic/plastic deformation, strengthening mechanisms, fracture basics.
- Functional properties overview: electrical, thermal, magnetic, optical; corrosion basics.
- Introduction to processing routes: casting, deformation processing, heat treatment, polymer processing, sintering, additive manufacturing (overview).
- Intro to materials selection concepts and sustainability considerations.

[CESE13] – Energy Systems

This course presents a holistic approach in the development of mathematical models for the simulation of energy systems. The outline of the course is as follows:

- Thermodynamic Properties and phase equilibrium
- Material and Energy Balances – Basic Principles
- Unit operations – Modeling
- Separation, reaction processes
- Heat exchangers
- Heat exchangers networks – pinch analysis

- Pumps, Compressors and Expanders
- Steam systems and evaporators
- Principles of energy systems simulation
- Simulation of energy process systems (ASPEN Plus)
- Optimization of energy process systems (GAMS)

[CESE14] – Engineering Design and Analysis

This course focuses on integrating design principles with practical engineering examples. Students learn systematic methodologies (e.g. approaches for safety and durability) for the design process, emphasizing problem definition, concept generation, and optimization. The course applies these principles directly to energy conversion systems, for example piping systems and pressure vessels, wind turbines, solar panels etc. Key topics include understanding system components, performance evaluation, material selection, and economic and sustainability considerations in the context of advanced engineering projects.

Key topics:

- Systematic Design Methodology: Applying structured phases (e.g., conceptual design, embodiment design, detail design) to solve complex engineering problems.

- Analysis of Energy Conversion Systems: Detailed study of how systems (like heat engines, turbines, or photovoltaic arrays) transform one form of energy into another, focusing on efficiency and performance.

- Sustainable Engineering Principles: Incorporating environmental impact, life-cycle assessment, and material selection to ensure designs are effective

- Optimization and Modelling: Using analytical and computational tools to refine design parameters and achieve maximum performance or cost-effectiveness.

[CESE15] – Electrochemical Energy Storage

This course introduces the principles and technologies of electrochemical energy storage, focusing on rechargeable batteries, electrochemical supercapacitors and introductory fuel cell concepts. Students explore electrode reactions, ion transport, electrolyte properties and the role of interfaces in determining device performance and degradation. Major rechargeable battery chemistries are discussed, including lithium-ion, sodium-ion, flow batteries, metal-air systems, and emerging solid-state architectures. The course also examines electrochemical supercapacitors, covering electric double-layer and pseudocapacitive mechanisms, materials selection and power-energy trade-offs. Fuel cells are presented at an introductory level, emphasizing their operating principles, efficiency, and their broader role within integrated clean-energy systems. **Laboratory demonstrations** emphasize hands-on characterization of electrochemical devices, including charge-discharge cycling of battery cells, measurement of specific capacity and Coulombic efficiency, open-circuit voltage analysis, and basic electrochemical diagnostics such as cyclic voltammetry. By the end of the course, students will understand the scientific foundations, performance metrics, and challenges of electrochemical devices used in modern sustainable energy applications.

[CESE16] – Computational Methods for Simulating Energy Materials

This course trains students in the computational design and simulation of energy materials, focusing on practical workflows and applications rather than abstract theory. Students learn how to set up atomistic models, prepare input files, and run simulations using free/open-source software such as LAMMPS and ASE. A strong emphasis is placed on Python programming, both for automating simulation tasks and for post-processing and analyzing results.

Through lectures and laboratory exercises, students gain hands-on experience in Molecular Dynamics (MD) and Monte Carlo (MC) methods, applying them to real energy challenges. Case studies include:

- Hydrogen and methane uptake in nanoporous materials (e.g. Metal Organic Frameworks – MOFs) for clean energy storage.
- Phase stability in alloy systems relevant to batteries.
- Thermal conductivity at the nanoscale for thermoelectric materials.

By the end of the course, students will be able to **design, simulate, and analyze energy materials** using modern computational tools, bridging the gap between engineering practice and scientific insight.

[CESE17] – Circuitry and Electronics

The course begins with the fundamental principles of electric circuit analysis, establishing the necessary background for understanding complex energy systems. Students will master DC and AC circuit theory, including Ohm's Law, Kirchhoff's laws (KCL/KVL), nodal and mesh analysis, and network theorems such as Thevenin and Norton equivalencies. Special emphasis is placed on AC power analysis, impedance, phasors, and the concept of Power Factor, which is critical for efficient energy transmission and grid stability.

Subsequently, the course introduces semiconductor physics and the operation of non-linear electronic devices. This includes the study of PN junctions and diodes, focusing on their application in rectification (AC to DC conversion) and voltage regulation. Students will also examine Bipolar Junction Transistors (BJTs) and Field Effect Transistors (MOSFETs), specifically analyzing their behaviour as electronic switches—a concept that forms the foundation of modern power management systems.

The curriculum then transitions to analogue signal processing and operational amplifiers (Op-Amps). Students will learn to design and analyse inverting and non-inverting amplifiers, integrators, and differentiators. This section highlights the application of Op-Amps in sensor interfacing and signal conditioning, which are essential for monitoring performance metrics in renewable energy technologies.

[CESE18] – Bioengineering and biotechnology

The course Bioengineering and Biotechnology introduces the principles of cell structure and function, covering prokaryotic and eukaryotic cells, membranes, organelles, and their roles in biological and industrial systems. It examines macromolecules, including the

structure and function of proteins, nucleic acids, carbohydrates, and lipids, with relevance to bioprocesses. Cell metabolism is addressed through metabolic pathways, energy production, catabolism, anabolism, and metabolic regulation in engineered systems. Enzyme topics include structure, catalytic mechanisms, kinetics, inhibition, and industrial applications. Cell growth concepts encompass microbial and cell culture growth phases, kinetic models, nutrient requirements, and environmental influences. The course covers genetics, DNA structure, replication, transcription, translation, genetic organization, and regulation of gene expression. Molecular techniques such as PCR, DNA sequencing, sequence analysis, and real-time PCR are discussed for qualitative and quantitative applications. Applications include microbial biotechnology for strain engineering and fermentation, plant biotechnology for tissue culture and crop improvement, animal biotechnology for cell culture and biopharmaceuticals with ethical considerations, aquatic biotechnology for aquaculture and environmental monitoring, bioremediation for pollutant degradation, and waste biotechnology for biological treatment and sustainable resource recovery.

[CESE19] – Sustainability Engineering and Circular Economy

This course provides an interdisciplinary introduction to the principles of the circular economy and environmental economics. Students will explore how economic systems impact the environment, how circular strategies can reduce waste and resource use, and what policy and business models support sustainability transitions. After analysing the basic background in the aforementioned concepts, the principles of Sustainable Development Goals (SDGs) of United Nations and the ESG (Environmental, Social, and Governance) criteria, students will have the opportunity to delve into indicative legislative milestones with an emphasis on the CSRD Directive -Corporate Sustainability Reporting Directive for sustainability reports, as well as the SEVESO Directive. Particular emphasis is placed on the management of critical/specific waste streams and by-products to support circular economy business models. The course also includes the demonstration of sustainability management tools, emphasizing on Life Cycle Assessment (LCA). The aim to highlight case studies of sustainable production and services design. Case studies are expected to be examined for a better understanding of the theory and preparation of students on issues related to the promotion of green technologies and environmental responsibility strategies for businesses. The course combines economic theory, policy analysis, calculation of economic indicators and real-world case studies to build practical understanding for the circular economy model approach.

[CESE20] – Electrical machines

The course begins with the introduction to machinery principles, i.e. production of a magnetic field in the electrical machines, magnetic circuits, core losses (hysteresis and eddy current losses), Faraday's law, electromagnetic and magnetomotive forces, force and torque production.

Transformers, i.e. theory and operation of the single and three-phase transformers, construction, equivalent circuit, phasor diagram, transformer power losses and efficiency, voltage and current relationships, three-phase transformer connections, ratings and autotransformer.

DC machinery fundamentals and DC motors and generators, i.e. construction, production of voltage and torque, equivalent circuit, analysis of dc motors and generators, connections, speed and voltage control, speed and torque characteristics.

Three phase and single-phase induction motors and generators, i.e. construction. voltage and torque relationships, equivalent circuit, speed and torque characteristics, speed control, theory and operation of single-phase induction motors.

Synchronous generators, i.e. construction, equivalent circuit, phasor diagrams, power and torque characteristics, operation of synchronous generators in parallel with the grid, transient operation.

Permanent magnet motor drives, i.e. theory of permanent magnets, construction, speed and position control of motor and generator drives, close loop control system, power converters, topologies.

[CESE21] – Clean Combustion

Chemical thermodynamics: Mass conservation and mixture stoichiometry, lambda value and equivalence ratio, energy conservation in chemical reactions, Gibbs free energy, chemical equilibrium, combustion temperature, equilibrium products. Chemical kinetics: Elementary reactions, propagation and branching, reaction rate, reaction rate constant, partial equilibrium and steady state approximations, reversible reactions, chain reactions, explosion limits, some important combustion mechanisms, pollutant formation kinetics, chemical time scales. Combustion Reactors: constant volume, constant pressure, well-stirred reactor, plug-flow reactor, dimensioning, stability, power considerations. Structure of laminar flame, theory of Mallard, flame thickness, flame speed. Conventional fuels and alternative fuels, including combustion of biofuels, biomethane, larger hydrocarbons, H_2, NH_3 and bio-alcohols. Main fuel properties of interest. Greenhouse gas and air pollutants formation and principles of pollution control (catalytic, non-catalytic, filtering, precipitators, scrubbers).

[CESE22] – Bioprocessing for Clean Energy Production

The course Bioprocessing for Clean Energy Production introduces global energy demands, sustainability challenges, and the transition to renewable systems, highlighting the role of bioprocessing in carbon neutrality, resource circularity, and integration with waste-management infrastructures. It covers biomass feedstocks such as agricultural residues and algae, along with physical, chemical, and biological pretreatment technologies. Core engineering principles include bioreactor design and operation for batch, fed-batch, and continuous systems, emphasizing mass transfer, agitation, and sensor integration. Fundamentals of anaerobic digestion are explored through anaerobic microbiology, methanogenesis, biomethanation, reactor types, and waste-to-energy concepts, followed by process optimization using ADM1, kinetic models, physicochemical dynamics, digester design, and scale-up. The course examines AI and machine learning tools for digester optimization, predictive control, and methane-yield enhancement. Emerging CO_2-to-CH_4 technologies, biohydrogen production, microbial fuel cells, and bioelectrochemical systems are discussed alongside liquid biofuels such as bioethanol,

biobutanol, and biodiesel. Integrated biorefineries, waste-to-bioproduct systems, future innovations in synthetic biology, and course projects conclude the curriculum.

[CESE23] – Electronic-Structure Computational Approaches for Materials in Energy Systems

This course introduces students to computational techniques for analysing the electronic structure, chemical behaviour, and spectroscopic properties of molecules, solids, and interfaces relevant to modern energy systems. Emphasis is placed on practical electronic-structure approaches that reveal how bonding, charge distribution, electronic levels, and optical characteristics influence the functionality of materials used in batteries, catalysts, photovoltaics, and other clean energy technologies. Students learn to construct and evaluate molecular and materials models, perform molecular structure optimizations, interpret vibrational and optical spectra, and assess electronic descriptors connected to reactivity and performance. Hands-on laboratory sessions use the WebMO platform on the university's HPC system, allowing students to run semiempirical and first-principles electronic-structure calculations through an accessible web interface. The course introduces cluster-based representations of solids and surfaces, and guides students in interpreting electronic features such as HOMO–LUMO gaps, localized electronic states, adsorption behaviour, and charge redistribution. Through a final mini-project, students design and communicate a focused electronic-structure analysis of an energy-relevant system. The course equips students with applied computational literacy, interpretive skills, and the conceptual vocabulary needed to understand and articulate electronic-level processes in materials used across energy engineering.

[CESE24] – Engineering professionalism

The course introduces students to the ethical, communicative, and professional standards expected in modern engineering practice. The course explores codes of conduct from engineering associations, emphasizing how regulations, standards, and ethical frameworks guide responsible decision-making. Students examine accountability in contemporary engineering contexts, including the appropriate use of AI tools, ownership of technical work, proper attribution, and managing one's professional reputation. A strong focus is placed on professional communication: structuring and writing technical reports, preparing effective presentations, and using digital tools to support clear, persuasive oral communication. Students are also introduced to scientific and conference publication practices, including research methods, referencing conventions, and dissemination approaches. The course supports students' professional development through guidance on CV preparation, understanding employment expectations, and planning for lifelong learning. Throughout the semester, students collect, analyze, and synthesize data to produce a technical report and present their findings in a formal oral presentation.

[CESE25] – Renewable Energy Technologies

This course examines the energy problem and renewable energy sources. The following renewable energy systems are examined: SOLAR ENERGY Thermal solar systems,

photovoltaic systems, and concentrated solar power systems. Design and sizing of solar thermal systems for domestic hot water production and building heating. Design and sizing of photovoltaic systems. WIND ENERGY Types of wind turbines and wind generators. Basic characteristics and properties. Methods and technologies of utilization. Estimation of the energy output of an individual wind turbine. GEOTHERMAL ENERGY High-, medium-, and low-enthalpy applications for power generation and thermal uses. Basic characteristics and properties. Methods and technologies of utilization. HYDROELECTRIC ENERGY Water turbines. Hydroelectric power plants. Pumped-storage power stations. Basic characteristics and properties. Methods and technologies of utilization. OCEAN ENERGY Tidal and wave power plants for electricity generation. Basic characteristics and properties. Methods and technologies of utilization. ENERGY STORAGE Thermal, electrochemical, and mechanical energy storage systems. HEAT PUMPS Dimensioning, operation characteristics, correlation with the outdoor environment, efficiency.

[CESE26] – Chemical and Physical Processes for Clean Energy Production

Introduction to reaction kinetics. Principles of chemical processes, types of chemical reactors, design equations, simple and multiple reactions, combination of reactors, nonisothermal reactors, catalytic reactions & reactors. Part II, Physical processes relevant to clean energy, basic principles and techniques: membrane-based methods (microfiltration, ultrafiltration), equilibrium-based processes (distillation, liquid-liquid extraction), and affinity-based separations (adsorption, ion exchange). Part III, Applications of Chemical and Physical processes to production of clean energy: renewable biofuels, including biodiesel from microalgae, bioethanol, biogas, and hydrogen. Introduction to the biorefinery concept, highlighting integrated processes that convert biomass into fuels, chemicals, and value-added products for a circular, low-carbon energy future.

[CESE27] – Life Cycle Sustainability Assessment (LCSA)

The course introduces the basic knowledge of Environmental Impact Assessment (EIA) and the respective compliance with environmental conditions within the framework of sustainable resources' management and relevant environmental legislation. The key points of Environmental Impact Studies and the relevant application of environmental legislation to projects and activities are analyzed. After analyzing the basic background and knowledge, the key points of Environmental Management Systems (EMS) and the monitoring of relevant environmental performance (mainly ISO 14001 and 50001 for energy issues) are analyzed. Students of this class will have the opportunity to delve into issues related to the management of construction site pollutants, waste and environmental risks with the ultimate aim of preserving the natural environment and minimizing social impacts. The course also focuses on the interactions between Energy and Environment by highlighting case studies from construction sites, environmental incidents in projects and techniques for optimal energy utilization and monitoring of environmental performance.

[CESEPD01] – Industrial Processes Design

The course introduces students to the application of feasibility studies in energy production industrial processes. It is based on a thorough feasibility study of a selected industrial plant, which varies each year, and the preparation of a detailed report that constitutes an important part of the overall course grade. The course covers the development and interpretation of methodological flow diagrams and the application of mass and energy balances for process analysis. Students learn the preliminary sizing and selection of key process equipment, as well as methods for estimation of project profitability. To support this, the course includes an extensive lab component where students use specialized software tools for industrial plant design. The course also addresses throughput analysis, identification of bottlenecks, and strategies for process optimization. Additionally, students explore the optimization of operating conditions using operational criteria and the principles of process scale-up. Finally, the course examines the determination and evaluation of quality parameters in outlet streams to ensure compliance with quality standards and sustainable operation.

[CESEPD02] – Operations Research and Optimization

This course provides a comprehensive introduction to optimization and mathematical programming, covering the formulation of models through the definition of variables, objective functions, parameters, and constraints. Students will explore linear programming in depth, including its theoretical foundations, graphical solution techniques, the Simplex method, duality theory, and sensitivity analysis. The course also examines classical algorithms such as transportation, assignment, and transshipment methods, along with hands-on experience in solving linear programming problems using computer software. Further topics include integer programming and non-linear programming, with attention to classical solution methods for constrained and unconstrained models, including the Karush–Kuhn–Tucker (KKT) conditions and practical applications. The course concludes with multi-objective linear programming, goal programming, and broader decision-making methodologies.

[CESECEA01] – Heat devices and engines

By accomplishing this course, students will be able to understand energy balance and ways in which is its applied. They will have obtained an insight into the fundamentals of issues addressed by the energy and manufacturing

Introduction to heating systems and equipment: principles and systems of heating. Thermal load calculation. Boilers, heating elements, heat pumps dimensioning and operation. Piping calculations and design of the heating network.

Introduction to Internal Combustion Engines: IC engine classification, engine components and terminology, engine maps. Sizing and use of IC engines in conventional and hybrid propulsion systems.

Introduction to Turbomachinery, typical layouts. relative motion of blading, efficiency and degree of reaction. phase changes in turbomachinery, cavitation.

Engines: Introduction. Gas Cycles (Otto, Diesel, Miller). Combustion Thermodynamics. Fuel-air cycles. Calculation of engine cycles and gas composition. Measurement Techniques. Analysis of indicator diagrams. Friction and lubrication. Fluid Mechanics in

4-stroke and 2-stroke engines. Turbocharging and supercharging. Fuel injection systems. Heat Transfer and Engine Cooling. Combustion in Otto and Diesel engines. Calculation of combustion rate. Pollutant formation and after-treatment technology. Fuels and lubricants. Operating maps.

[CESECEA02] – Energy systems control

This course provides a comprehensive analysis of the dynamic response and the design of control systems for energy systems. The course outline is as follows:

- Principles of Feedback Control – Elements of control
- Analysis of dynamic behavior (Stability, dynamic response)
- Single feedback control loop design (PID, controller tuning, cascade, feedforward, time delay systems)
- Multi-loop feedback control system design (interaction, decoupling)
- Frequency response control system design methods
- State-space model representation, state feedback control system design

[CESESS01] – Distributed energy production

Introduction (Traditional Power Systems, Definition and evolution of distributed generation (DG), Centralized vs decentralized energy, Microgrids and prosumer models, DER classification: generation, storage, demand response)

Solar Photovoltaic (PV) Systems (PV cell physics, Current–voltage characteristics, temperature effects, Maximum power point tracking (MPPT), Inverters: grid-tied, hybrid, microinverters, AC/DC coupling, Grid integration: voltage rise, unbalance, harmonic issues, Standards: IEEE 1547, UL 1741, anti-islanding)

Wind Energy Systems (Turbine types and power curves, Generator systems: induction generators, DFIGs, synchronous generators, PMSGs, Power electronics for wind, Electrical behavior under variable wind, Grid integration challenges: reactive power, flicker, fault ride-through, Hybrid wind + storage systems)

Small Hydro & Other Distributed Renewables (Run-of-river hydro and micro-hydro electrical systems, Turbine-generator selection and control, Bioenergy systems: CHP, biogas generators, electrical interconnection, Emerging technologies (tidal stream, wave converters, airborne wind, etc.)

Power Electronics for Distributed Energy (Inverter topologies and modulation techniques, Harmonic generation and filtering, Anti-islanding and protection schemes, Grid-forming vs grid-following inverters)

Electrical Interconnection of DG Systems (Single-line diagrams, system topology, DG impact on distribution feeders, Voltage regulation and control strategies, Reactive power management (Volt-VAR, Volt-Watt control), Protection issues: bi-directional power flow, fault current contribution, Islanding, microgrid operation modes (grid-connected vs islanded)

System Modeling, Simulation, and Tools (Load and generation profiles, Time-series modeling of intermittency, Power flow studies (MATLAB, PSSE, DIgSILENT, OpenDSS), Sizing of PV-battery systems, Optimization of DER placement)

Microgrids & Smart Grid Integration (Microgrid architectures (AC, DC, hybrid), Control hierarchy: primary, secondary, tertiary, Resilience and black-start capability, Demand response and intelligent loads)

Economics, Policy & Project Development (Cost analysis (CAPEX, OPEX, LCOE), Incentives, feed-in tariffs, net metering, Regulatory frameworks for distributed generation, Project sizing, siting, feasibility studies, Reliability assessment and risk management, Environmental impact and sustainability metrics)

[CESESS02] – Hydrogen and Fuel Cells

This course provides a comprehensive introduction to hydrogen as an energy carrier and to fuel cell technologies for clean power generation. Students explore the fundamental properties of hydrogen, its production routes (electrolysis, reforming, thermochemical and biological processes), storage methods and safety considerations. The course examines the operating principles, thermodynamics and performance characteristics of key fuel cell types, including PEM, solid oxide and high-temperature proton-conducting systems. Attention is given to electrode reactions, ion and gas transport, water and heat management, catalysts, and degradation mechanisms. The role of hydrogen and fuel cells in energy systems integration, mobility, industrial decarbonization and grid balancing is analyzed using real-world case studies. Laboratory demonstrations introduce basic diagnostic tools, such as polarization curves, efficiency measurements and impedance-based performance assessment. By the end of the course, students will understand the scientific and engineering foundations that enable hydrogen and fuel cell technologies to contribute to a sustainable energy future.

[CESE28] – Senior project

A full semester technical report in one of the fields of study.

[CESEPD03] – Energy Finance

By accomplishing this course, students will be able to understand how financial principles operate within the energy sector and how energy commodities are produced, traded, priced, and financed across global and regional markets. The course introduces the functioning of the Energy Exchange, including spot and futures markets, trading mechanisms, and the role of market participants such as producers, utilities, traders, and financial institutions. Students will gain insight into energy trading strategies, price discovery, volatility, and the use of financial instruments to manage risk. The content also explores investment decision-making in conventional and renewable energy projects, the impact of regulation and energy policy on financial performance, and the growing importance of sustainability and carbon markets. Emphasis is placed on linking market dynamics with financial analysis to support informed decisions in energy investment, trading, and risk management.

[CESECEA03] – Applications in Agriculture

The course Applications in Agriculture explores renewable energy and bioenergy technologies for sustainable agricultural systems, beginning with fundamentals of solar

energy, including radiation capture, insolation, thermal-mass utilization, optimal orientation, and contributions to farm sustainability. It covers passive solar heating and cooling through greenhouse and barn design, solar chimneys, natural ventilation, heat storage, and low-cost performance improvements, alongside solar thermal systems such as flat-plate and evacuated-tube collectors for water heating, livestock facilities, crop drying, and postharvest operations. Solar-powered agricultural technologies including photovoltaic irrigation, pumping, electric fencing, remote sensing, monitoring, precision agriculture, and off-grid solutions are examined. Geothermal energy principles are introduced, covering resource classification, soil thermal properties, and agricultural suitability, followed by shallow geothermal geoexchange systems, ground-source heat pumps, loop configurations, and seasonal storage. Direct geothermal applications for greenhouses, aquaculture, processing, crop drying, and climate control are discussed. The course also addresses agricultural biomass resources, pretreatment and pelleting processes, anaerobic digester design, and best practices for biogas systems, including stability enhancement, digestate valorisation, upgrading, safety, and farm-scale energy integration.

[CESESS03] – Smart grids

The course begins with the introduction to smart grid, evolution of electric grid, definitions and equipment needs, functions and opportunities, challenges and benefits. Difference between conventional and smart grid.

Analysis of smart grid technologies, i.e. smart energy resources, substations and automation, transmission systems: EMS, FACTS, HVDC, protection and control, energy management, distribution systems: Volt/Var management, fault detection, auxiliary services, phase shifting transformers and electric vehicles.

Smart meters and advanced metering infrastructure. Power quality management. and EMC. Grid connected renewable energy sources. Power quality conditioners and monitoring. Power quality audit.

Computing for smart grid applications. Local/house area network. IP protocols. Cloud computing and cyber security for smart grids. Broadband over Power Lines (BPL)

[CESE29] – Capstone project

A full semester technical report, including original work and research in one of the fields of study.

B. ELECTIVE COURSES

[CESE01EL] – Energy Systems in the Built Environment

This course examines how buildings can transition toward sustainable, low-carbon futures through renewable energy systems (mainly solar technologies) focused on urban

environment application covering heating- cooling needs on terms of thermal comfort. Energy systems,, planning and dimensioning in regards to, energy efficiency, health and well being of users and climate-resilient infrastructure is also a key issue of the course. Students will explore the interplay between urbanization, energy demand and consumption, automations (BACS - Building Automation Control Systems), smart systems, cost effectiveness and environmental impacts (oriented to carbon footprint). The course integrates sustainability science, urban policy, and engineering approaches to equip students with analytical and practical tools for energy efficient urban development, buildings certification (LEED and BREEAM) providing a holistic approach to the design of urban planning in compliance to energy and climate policy.

[CESE02EL] – Energy and Environment

The course introduces students to the scientific principles that govern the interaction between the energy systems and the environment, providing a foundation for understanding the environmental challenges and opportunities of the clean-energy transition. It examines how different forms of energy production, conversion, and use—including oil, coal, natural gas, nuclear energy, biomass, geothermal, hydroelectric, wind, solar, and other renewable sources—affect climate change, air quality, natural resources, and ecosystems. Students study the environmental impacts of fossil fuels and emerging clean-energy technologies, focusing on greenhouse gas emissions, pollutant formation, carbon and nutrient cycles, and ecosystem interactions. The course explores lifecycle assessment, environmental footprint analysis, and sustainability metrics to evaluate energy technologies and systems. Attention is given to both local and global environmental consequences of energy choices, as well as the trade-offs involved in adopting different energy pathways. Through case studies, quantitative analysis, and applied examples, students develop the skills to assess the environmental performance of energy systems and to propose strategies for low-carbon, resource-efficient, and ecologically responsible energy solutions. The course emphasizes the critical role of science-based decision-making in guiding the transition toward sustainable and clean energy future.

[CESE03EL] – Turbomachines

Introduction to turbomachinery, general principles, typical configurations. The turbomachinery and the operation system. Typical characteristics of turbomachines, similarity laws, cooperation of several turbomachines, operation in series or in parallel. The fluid mechanics and thermodynamics of turbomachines, thermodynamic cycles of gas and steam turbines. The relative flow, velocity triangles, Euler's equation. Aerodynamics of turbomachinery, basic principles of operation, non-dimensional numbers, efficiencies, reaction. Axial compressors: design, operation, limiting factors. Blade aerodynamics for axial compressors operating both in sub- and super-sonic regions. Flow phenomena, 3D effects, tip leakage flows. Radial turbomachinery: Description, velocity triangles, design and operation problems. Axial turbines: Blade design and construction characteristics, 3-D flows. Blade cooling methodology and construction problems. Pumps: Study of the phase change of water under extremely low pressures, cavitation. Operational characteristics analysis of 3-D flow effects, multistage pumps, technical and operational

problems. Radial turbines. Theory of design and operation, study of the flow in radial turbine rotors. Water turbines: Fluid mechanics of Pelton, Francis and Caplan turbines. Design and construction, operational characteristics cavitation.

[CESE04EL] – Modeling and Optimization of Energy Systems

The course introduces students to state-of-the-art topics for the modeling and optimization of energy systems, including modelling of hybrid feedstock energy systems, energy supply chain networks, polygeneration systems, combined heat and power systems, energy markets and energy planning.

In the first half of the semester computer-aided techniques for Energy Systems Modeling and Optimization will be introduced including: energy and material balances, introduction of variables for technology description and energy flows, definition of operating and design constraints. Tools and framework such as Linear, Mixed-Integer Linear and Non-Linear modeling and Optimization will be described with emphasis on the Modeling with 0-1 variables for technology selection in energy-related plants and flowsheets. Definition of objectives functions such as economic or environmental-related. Efficient Modeling of complex logic-based decisions and constraints. Illustrative examples considering multi-energy systems. Emphasis will be placed on formulating an optimization model which includes the following steps:

- Understanding complexity and implications of the model choice
- Brief overview of solution methods
- Solving optimization problems of a computer
- Interpreting solutions of optimization models

In the second half Multi-echelon energy and production supply chains will be described and quantified. This include definition of nodes/echelons, introduction of storage, modeling of transportation means, selection of warehouses and distribution centers. Moreover, mModeling and Optimization of long-term energy planning will be studied including introduction of energy generation technologies (conventional and renewable energy-based), constraints, energy demands, availability of energy resources, modeling of environmental and energy policies. Development of an integrated Mixed-Integer Linear Programming Model (MILP). Finally, Fundamentals of energy markets modeling and Optimization will be described.

[CESE05EL] – Battery management in Electrical Vehicles

The course begins with a comprehensive overview of Electric Vehicle (EV) subsystems and powertrain configurations. Students explore the specific requirements for traction batteries compared to stationary storage, delving into the modeling of Lithium-Ion cells. This foundation allows for a detailed study of equivalent circuit models (ECM) used to predict battery behavior under the intense, dynamic current profiles typical of automotive drive cycles.

A significant portion of the course is dedicated to the hardware and software design of Battery Management Systems (BMS). Students examine the critical safety functions of a BMS, including over-current, over-voltage, and over-temperature protection. The curriculum covers topology design for cell monitoring and the various passive and active cell balancing techniques required to maximize the usable capacity and lifespan of a battery pack.

Moving into algorithmic controls, students learn the mathematics behind "State Estimation." This involves applying techniques such as Coulomb Counting and Extended Kalman Filters (EKF) to accurately estimate the State of Charge (SOC) and State of Health (SOH) in real-time. The course also addresses the thermal management of battery packs, discussing air, liquid, and phase-change cooling systems essential for maintaining optimal operating temperatures.

Finally, the course addresses the integration of EVs with the external energy ecosystem. Topics include on-board and off-board charging topologies, communication protocols (such as CAN bus and ISO 15118), and the emerging role of EVs in grid stability through Vehicle-to-Grid (V2G) technologies. Students conclude with a review of second-life battery applications and recycling challenges, trying back to the clean energy circular economy.

[CESE06EL] – Energy from the Chemical Recycling of Waste Plastics

This course examines the principles and technologies of polymer waste recycling, with emphasis on energy recovery and the production of fuels and value-added chemicals within a circular economy framework. Students are introduced to the fundamentals of polymers and plastics, global production and waste trends, polymerization mechanisms and the physical and chemical properties of major commodity polymers such as polyethylene, polypropylene, PET, PVC and polystyrene. The course covers polymer waste streams and sorting technologies, followed by a detailed analysis of recycling strategies, distinguishing mechanical and chemical recycling approaches. A major focus is placed on thermo-chemical recycling technologies, including pyrolysis and gasification, with discussion of reaction pathways, product distributions, syngas and hydrogen-rich streams, and fuel-quality upgrading through catalysis. Fundamental aspects of polymer degradation kinetics and thermodynamics, as well as basic reactor concepts, are introduced. Environmental and life-cycle considerations are addressed, including greenhouse gas emissions, hazardous components, microplastics, regulatory challenges and feedstock quality requirements. Laboratory demonstrations include polymer identification, thermal analysis and bench-scale pyrolysis experiments, complemented by product characterization. Through a mini-project, students apply techno-economic and sustainability concepts to real-world plastic-to-energy scenarios.

Teaching - Knowledge testing - Student evaluation

The JEUPS is taught with the physical presence of teachers and students in the classrooms. By decision of the Curriculum Committee, a weekly zone of online education

may be established, common to all students of the JEUPS, which will be used to conduct tutorial and/or seminar courses and, exceptionally, to make up for courses in cases where they are not available for the This purpose classrooms on other days of the week. In exceptional cases of dealing with extraordinary circumstances that prevent face-to-face teaching, deliveries may, by a specially reasoned decision of the Chairs of the Participating Schools and the Director of the Program, be carried out online for a finite period of time, which is necessary in order to deal with the extraordinary circumstances that justify the transition to distance learning in the short term.

Similarly, examinations are conducted in the physical presence of students and examiners in the classrooms of the Schools, whether they are conducted in writing or orally. Exceptionally, only oral examinations can be conducted remotely, provided that the identification of the examinees is ensured and the best practices for conducting oral examinations via the internet are followed, in order to ensure their integrity. distance learning examinations are not allowed, except in the cases and under the conditions mandatorily provided for by the applicable legislation. By decision of the Curriculum Committee, written examinations using tablets, laptops or PCs are allowed if they are carried out with the physical presence and supervision of the examinees in the halls of the Schools, under the guarantees of a comprehensive plan for the conduct of these examinations, which will ensure their integrity and the equal treatment of the examinees.

Attendance at courses, tutorials and any other organized educational activity of the Foreign Language Undergraduate Study Program is mandatory. Students may be absent up to thirty percent (30%) of the total teaching hours of each course per semester, while deviations from this limit are allowed only in exceptional cases, with the approval of the Curriculum Committee. lectures, tutoring and examinations are considered an essential element of academics for the successful course of students in the Program.

Before the beginning of each semester, the Secretariat of the JEUPS prepares and publishes the detailed teaching schedule of the semester, taking care that, as far as possible, the compulsory and elective courses (a) are equally distributed over all days of the week, (b) there is no long time gap between the courses during the same day on which they happen to be taught and (c) do not coincide with the teaching of other Y or E courses of the same semester of study.

Upon completion of the tenth (10th) teaching week of each semester, students are invited to participate in an anonymous electronic evaluation of the courses taught to them, as well as of the teachers, in order to improve their level of study.

Student evaluation

1. The students of the JEUPS They are evaluated by written or oral examinations, which are held at the end of the semester for the courses taught in the same semester and by taking into account any other work or intermediate examination and grading, as defined in the description issue of each course. All subjects are examined during the repeat examination period in September. The student's participation in an oral

examination excludes his/her participation in the written examinations of the same course during the same examination period.

2. Lecturers take special care for the oral examination of students with proven dyslexia or with severe mobility problems or with visual impairments that significantly hinder their participation in written examinations, in accordance with a procedure set out in the applicable provisions.

3. The Secretariat of the Program publishes in a timely manner the detailed schedule of the written examinations for the upcoming examination period. Under the responsibility of the teachers, assisted by the Secretariat of the JEUPS, a sufficient number of invigilators are ensured by PhD candidates and postgraduate students. Teachers must be constantly present at the examination sites, exercise supervision for their smooth and impartial conduct and take the measures necessary for these purposes.

4. Each examinee must check, before appearing for the specific examination, the inclusion of his/her name in the computerized list of the Secretariat for the beneficiaries of participation in the examination of the specific course. Examinees are prohibited from copying or falsifying in any other way the result of the examination process, as well as from presenting books, aids, notes that are not provided or electronic means of communication to the examination rooms. Any attempt to use electronic means of communication during the examination process is a particularly aggravating case against the examinee. Furthermore, examinees are prohibited from using a separate sheet as a draft. For this purpose, they are allowed to use the last page of their writing. In case of violation of these conditions, it is necessary to nullify the script as a measure of internal order to ensure the integrity of the examination process, without prejudice to any other sanction that may be imposed in accordance with the provisions in force.

5. The designated invigilators must check the academic identity that proves the student status and certifies the identity of the examinee, verify the inscription of the student's name and special registration number on his/her paper, initialize each paper, supervise the examinees so that they do not copy or talk to each other, to constantly supervise the entrances and exits of the room, especially at the end of the examination time and delivery of the papers, and to ensure that no examinee leaves or leaves the examination room before thirty minutes (30') have elapsed from the distribution of the subjects.

6. The written examination of each course lasts a maximum of two (2) hours for all courses.

7. After the papers are delivered, the invigilators count the papers they have received and one of them certifies the number of papers received. The papers are then handed over to the teacher, who counts them and confirms with his signature before the invigilator the number of papers received.

8. Instructors must submit to the Secretariat of the Program the results of the final examinations, written and/or oral, uniformly in the same grade for each subject, no later than twenty-five (25) days from the day of each examination. In the case of oral examinations, the instructor is not allowed to announce the result of the examination to the examined students, but only in aggregate for all those examined, written and/or oral, at the end.

9. In all courses of the JEUPS, the result of the student's knowledge test is expressed numerically with grades from zero (0) to ten (10). In the grading lists, failure

is marked with grades from zero (0) to four (4) and success with grades from five (5) to ten (10).

10. It is not allowed to publish examination results in any way with the names of the examinees visible, except by quoting their special register number (AEM).

11. It is not allowed to transfer a student's grade from one examination period to the next. Clauses that may be written in the examinees' script and concern their desire to be cut if they are evaluated with a grade lower than the desired one, or references to how many courses one owes to get a degree, are not allowed and if they are, they are not taken into account.

12. The answers to the questions of the written exams, practical and theoretical, are discussed after the publication of the results by the teachers with the interested students at specially designated times, and the examinees have the right to see their script - of the current examination period - and ask for explanations on the way in which it was evaluated. Teachers have the obligation to post on their e-learning the proposed solutions of the subjects they put in the exams.

13. For the calculation of the degree grade and the composition of the courses indicated therein, the twenty-seven (27) compulsory courses necessary for the accumulation of one hundred and eighty (180) ECTS credits from Compulsory (Y) courses, the five (5) Elective (E) courses and the two (2) assignments required for the accumulation of sixty (60) ECTS credits are counted. i.e. two hundred and forty (240) ECTS credits in total.

Article 9
Scholarships

In the context of the Joint Undergraduate Program of Studies in English (JEUPS) of Study in Clean Energy Science and Engineering of the Aristotle University of Thessaloniki, it is possible to grant scholarships to students, based on academic and objective criteria and following a decision of the Curriculum Committee. Indicatively:

- It is possible to grant up to three (3) scholarships per academic year to students who stand out during the selection process, based on the overall evaluation of their qualifications (including the results of the oral interview), and were ranked among the first entrants of the cycle. These scholarships consist of a complete exemption from the payment of tuition fees for the first academic year.
- An excellence scholarship with exemption from the payment of fifty percent (50%) of the following academic year's tuition fees may be awarded to the student who obtains the highest average performance score in all courses of each year, provided that he/she has successfully completed all courses within the prescribed time. In case of a tie, the scholarship may be awarded to more than one student.
- The Curriculum Committee may award excellence awards to students who demonstrate outstanding performance during their studies. The awards may be accompanied by an honorary distinction or a cash prize. In particular, at the end of each academic year, a first-year prize may be awarded year, based on overall performance in all subjects and consistency in attendance. Similarly, an excellent graduate award may be awarded to the student with the highest academic performance during the course of study.

- A full or partial exemption from the payment of tuition fees may be provided, following a reasoned decision of the Study Programme Committee, for students coming from war zones or under international or subsidiary protection, based on documented social and humanitarian criteria.
- In exceptional cases, a scholarship of a social nature may be granted to candidates or students of the Program who are facing serious financial difficulties, health issues, loss of a parent, or live under a state of emergency or long-term crisis, after examination of the relevant application and the accompanying supporting documents by the Study Program Committee.
- It is also possible to grant reciprocal scholarships, which consist of exemption from the payment of part of the tuition fees, with the obligation of the student to offer a specific project in support of the Program. This work may include library subscription, support of administrative functions, assistance in research projects or other activity to be determined by the Curriculum Committee, in consultation with the Secretariat and the faculty members. The duration and content of the contributory scholarship are clearly defined when it is awarded, while non-compliance with the obligations may lead to its revocation.

The awarding of the above-mentioned scholarships and/or excellence awards, the specific terms of granting, the obligations and rights of the scholars are determined by decision of the Study Program Committee and are at its sole discretion on the basis of the financial capabilities of the Program and its cash reserves.

Article 10
Teaching Staff of the JEUPS

The teaching work of the Interdepartmental Foreign Language Undergraduate Studies Program (JEUPS) is allocated by decision of the Curriculum Committee to teachers with a subject related to the subject of the teaching work assigned to them. By decision of the Curriculum Committee, the teaching of the courses of the Program for the next academic year is assigned to the teaching staff who will be available during it. In particular, the following may be employed as teaching staff of the JEUPS:

α. members of the Teaching and Research Staff (D.E.P.), of the Collaborating Schools or other Schools of the Aristotle University of Thessaloniki or of another Higher Education Institution (HEI) with additional employment beyond their legal obligations as defined in article 155 of Law 4957/2022,

β. Emeritus Professors or retired faculty members of the Collaborating Schools or other Schools of the Aristotle University of Thessaloniki or other HEI,

γ. members of Special Educational Staff (E.E.P.), Laboratory Teaching Staff (E.DI.P.) and Special Technical Laboratory Staff (E.T.E.P.) of HEIs, who hold a doctoral degree and have teaching experience, as well as sufficient scientific, writing or research activity,

δ. adjunct lecturers,

ε. visiting professors and visiting researchers,

στ. contract researchers,

ζ. researchers and special functional scientists of the research centers of article 13A of Law 4310/2014 (A' 258) or other research organizations in Greece and abroad, who hold a doctoral degree and have teaching experience and sufficient scientific, writing or research activity,

η. Postdoctoral students and young scientists, holders of at least a doctoral degree, who have specialized knowledge or relevant experience in the subject of the JEUPS,

θ. collaborating professors.

The assignment of the teaching work of the JEUPS is carried out by decision of the Curriculum Committee, following the recommendation of the Director, who cooperates for this purpose with the Presidents of the Collaborating Schools. The decision of the Curriculum Committee ensures that the teaching and the educational activities in general assigned to faculty members in the context of the JEUPS do not affect in any way their other educational, research and administrative obligations towards the Department and the Greek-language Undergraduate Program. The decision of the Curriculum Committee on the assignment of teaching work is issued no later than the beginning of each academic semester and must include its lecturers JEUPS, the courses, the educational activities and the total teaching hours assigned per lecturer according to the curriculum per academic semester, as well as the total cost of their remuneration, provided that the payment of a fee is provided for and is communicated without delay to the Special Account for Research Funds (E.L.K.E.) of the Aristotle University of Thessaloniki. All categories of teaching staff are remunerated exclusively from the resources of the JEUPS, provided that their remuneration is provided. The amount of remuneration per category of teaching staff is determined following a decision of the Curriculum Committee and in accordance with the rules governing the E.L.K.E. A.U.TH. regarding the contracts for the remuneration of the Institution's staff, external collaborators, the exercise of additional teaching work and the total teaching hours assigned on a case-by-case basis.

The obligations of the lecturers include, among others, the description of the course or lectures, the way the course is examined, as well as the communication with the students necessary for the academic purposes of the program.

Teachers are obliged to follow the weekly teaching schedule in accordance with the timetable, as drawn up and determined by the Committee, and to follow the examination and evaluation conditions as described in this Regulation.

Article 11
JEUPS Revenue - Tuition Fees - Financial Management Process

The resources of the JEUPS may come from:

α. tuition fees,
β. donations, sponsorships and all kinds of financial support,
γ. bequests,

δ. resources from research projects or programmes, in particular those of the European Union,

ε. own resources of the Aristotle University of Thessaloniki, the amount of which cannot exceed five percent (5%) of the total budget of the D.A.P.P.P.S. and

στ. any other legitimate reason.

Tuition fees

For the study of the JEUPS, a total tuition fee of thirty-two thousand (€32,000) is paid, which is divided into eight thousand euros (€8,000) per academic year. The amount of the tuition fees is determined and modified by decision of the Senate of the Aristotle University of Thessaloniki, while the method and time of payment may be adjusted by decision of the Study Program Committee.

The payment of tuition fees is made by the students themselves (or by a third natural or legal person on their behalf) in a bank account held by the E.L.K.E. A.U.TH., in eight (8) equal installments of four thousand euros (€4,000): The first installment during the student's registration process in the Program and the following ones before the start of each semester. After the payment of the tuition fees, the corresponding document is issued and the student is informed electronically.

Payment is made electronically, according to the instructions sent with the confirmation of receipt of the application. The amount is deposited at the E.L.K.E. A.U.TH. and is not refunded in case of non-acceptance or withdrawal of the application.

In case of acceptance of the place in the Program, candidates are required to pay the amount of one thousand euros (€1000) as an advance payment of tuition fees. This amount is also paid to E.L.K.E. A.U.TH. and **is not** refundable in case of resignation from studies.

Financial Management Process

The management of the resources of the JEUPS under the supervision of the Department of Mechanical Engineering in collaboration with the School of Chemistry and the School of Agriculture is carried out by the Curriculum Committee through the Special Account for Research Funds (E.L.K.E.) of the Aristotle University of Thessaloniki and is allocated as a priority to meet the operational needs of the JEUPS and, if there are cash reserves, these may be allocated to cover other educational and developmental needs of the Department of Mechanical Engineering of the Faculty of Engineering, the Department of Chemistry of the Faculty of Sciences, and the Department of Agriculture of the Faculty of Agriculture, Forestry & Natural Environment, at rates of 48.7%, 38.1% and 13.7%, respectively.By decision of the Board of Directors, following the recommendation of the Research Committee of the E.L.K.E., the percentage of withholding in favor of the E.L.K.E. of the Aristotle University of Thessaloniki is determined.

The operating expenses of the JEUPS also include the remuneration of the teachers and visiting professors. The amount of the remuneration per category of teaching staff is determined by the Curriculum Committee, in accordance with the Remuneration

Regulation of the E.L.K.E. A.U.TH. and up to the maximum allowed limit per teaching hour. The Committee may decide on the staggered differentiation of the fees, depending on the number of admitted students per academic year.

Furthermore, the operating expenses of the Program also include the travel expenses carried out for the needs of organization and operation of the JEUPS and approved by its Study Program Committee. Travel expenses are borne by the budget of the JEUPS and are paid to the movers after the presentation of the relevant documents, in accordance with article 248 of Law 4957/2022 and the subsequent relevant amendments.

The resources of the JEUPS are distributed as follows:

α. an amount corresponding to ten percent (10%) of the total income derived from tuition fees is withheld by the E.L.K.E. for the financial management of the Program. By decision of the Board of Directors, it is decided whether the remaining amount, if it arises after the deduction of the withholding in favor of E.L.K.E., is transferred to the regular budget or is allocated for the creation of projects/programs through the E.L.K.E. A.U.TH. in order to cover, as a matter of priority, the needs of the Greek-language Undergraduate Programs of the Schools of Mechanical Engineering. Chemistry and Agriculture, which operate without tuition fees, as well as the coverage of research, educational and operational needs of the Aristotle University of Thessaloniki. b) to d) of Article 11, the withholding in favor of E.L.K.E. is carried out for the revenues from corresponding sources of financing,

β. the remaining amount of the total revenues of the JEUPS is allocated to cover the operating expenses of the JEUPS

Article 12
Administrative Support - Logistical Infrastructure

The Foreign Student Support Unit is responsible for the support of foreign students of the JEUPS, based on article 212 of Law 4957/2022. The mission of the Foreign Student Support Unit is to support foreign students enrolled in first, second and third cycle study programs of the HEI. Students are:

α. The support of foreign students for their enrollment in foreign language study programs of the Aristotle University of Thessaloniki.

β. To support foreign students in the issuance of an entry visa and a residence permit in the country for study purposes and to communicate with the competent public bodies on these issues

γ. To support the process of concluding contracts for the accelerated granting of residence permits for study purposes, in accordance with article 37 of Law 4251/2014 (A' 80)

δ. To support students during their settlement in the country

ε. The cooperation with the co-competent services of the Aristotle University of Thessaloniki for the service of foreign students.

στ. The care for the organization of courses for the learning of the Greek language or other foreign languages in collaboration with the competent units of the Aristotle University of Thessaloniki.

ζ. The exercise of any other competence specified in the Organization of the HEI and related to the subject of the Foreign Student Support Unit.

Administrative Support of the Program.

The Schools of Mechanical Engineering, Chemistry and Agriculture of the Aristotle University of Thessaloniki, having long experience in the organization and implementation of first, second and third cycle study programs, undertake the overall administrative and technical support of this JEUPS. The secretarial support is provided by the Secretariat of the JEUPS, which may be staffed by staff of the Secretariat of the three participating Schools being a key operational arm of its administration and operates under the supervision of the Curriculum Committee.

More specifically, the Secretariat of the Program:

α. Administratively supports the Committee and the Director of the JEUPS

β. Handles the issues of the educational life cycle of students, from enrollment to graduation and the issuance of their degree

γ. Adheres to the protocol, the printed and digital file of the Program

δ. Handles the administrative procedures concerning the teaching staff of the Program (contracts, transfers, etc.)

ε. cooperates with the Special Account for Research Funds of the Aristotle University of Thessaloniki for the financial management of the Program and the support of the relevant procedures.

The **Coordination of the Secretariat** of the JEUPS, as well as the observance of the minutes of the Program Committee, may be undertaken by an executive of the Secretariat of the Greek-Language Undergraduate Program of the Department of Mechanical Engineering, or by another executive who has the formal qualifications for the exercise of the duties of Head, in accordance with article 1 of Law 3839/2010. The relevant assignment is made by decision of the Committee of the JEUPS

In this context, in order to support the needs of the Program, the following may be employed, in accordance with article 104 of Law 4957/2022:

α. Members of the regular administrative staff of the Aristotle University of Thessaloniki, with additional employment in addition to their legal obligations, following a decision of the Research Committee of the E.L.K.E., following the recommendation of the Committee of the JEUPS

β. additional staff, which is selected in accordance with the procedure of article 243 of Law 4957/2022.

The cost of the remuneration of all categories of staff is borne exclusively by the budget of the Programme.

The technical support of the program's operation is centrally ensured by

specialized staff of the Digital Government Unit of the Aristotle University of Thessaloniki, the existing technical staff of the General Directorate of Technical Services and Computer Organization of the Aristotle University of Thessaloniki and the technical staff of the Collaborating Schools.

For the implementation of the teaching of the courses of the JEUPS, the existing building and logistical infrastructure of the Schools of Mechanical Engineering, Chemistry and Agriculture of the Aristotle University of Thessaloniki is used.

Article 13
Type of Degree Awarded

The Degree of the JEUPS is a public document and is awarded to the graduates of the Program.

The degree is issued by the Secretariat of the Program. The Schools of Mechanical Engineering, Chemistry and Agriculture and the Institution, the emblem of the Aristotle University of Thessaloniki, the date of completion of the studies, the date of issuance of the degree, the graduation protocol number, the title of the JEUPS, the grade of the degree, the student's details and the evaluation characterization are indicated: Good, very good, excellent.

The graduate may be granted, before the award, a certificate of successful attendance and completion of the Program.

In addition to the Degree, a Diploma Supplement is also granted, in accordance with article 15 of Law 3374/2005 and Ministerial Decision Φ5/89656/Β3/13-8-2007 (Government Gazette 1466/Β'). The Diploma Supplement is an explanatory document, which provides detailed information on the nature, level, content, educational context and legal status of successfully completed studies. It is not a substitute for the official degree or the transcript of grades issued by the Institution.

Article 14
Certification - Evaluation of JEUPS

Following the issuance of the decision for the establishment of the JEUPS and before the commencement of its operation, the certification of the JEUPS by the National Authority for Higher Education (H.A.A.E.) is required, in accordance with par. c) of par. 1 of article 8 of Law 4653/2020 (A' 12). After their establishment, the JEUPS are periodically certified, in accordance with sub. bb) of par. b) of par. 1 of article 8 of Law 4653/2020, in the context of the evaluation of the academic unit in which they belong.

The JEUPS is evaluated in the context of the periodic evaluation/accreditation of the academic unit by the National Authority for Higher Education. In particular, the

overall evaluation of the work carried out in the JEUPS, the degree of fulfillment of the objectives set at the time of its establishment, its sustainability, the absorption of graduates into the labor market, the degree of its contribution to research, its internal evaluation by the graduates, the feasibility of extending its operation, as well as other data related to the quality of the work produced and its contribution to the national strategy for higher education are evaluated.

If the JEUPS during its evaluation stage is judged not to meet the conditions for its continued operation, its operation is completed with the graduation of the already enrolled students in accordance with the decision of its establishment.

Internal Evaluation of the Quality Assurance Unit

In order to ensure and improve the quality of the JEUPS, the Quality Assurance Unit of the Aristotle University of Thessaloniki (MODIP-A.U.Th.) carries out a periodic internal evaluation of the JEUPS within the framework of the Institution's Internal Quality Assurance System and in accordance with the instructions and directions of the A.H.A.E.

The obligations of the administrative bodies and the teachers of the program also include all the procedures provided, based on the respective instructions and directions of the Quality Assurance Unit – Aristotle University of Thessaloniki. for the internal and external evaluation and accreditation of Study Programs and Academic Units.

Evaluation of teachers and courses by students

With the sole purpose of improving the level of studies of the JEUPS and with absolute assurance of their anonymity, students are invited to evaluate the courses and the teachers of each semester.

For reasons of uniform keeping of statistical data and the possibility of extracting conclusions that can be used for the educational work of the Faculties, Schools and the Institution as a whole, the evaluation questionnaires are compiled by the MODIP. and can be partially differentiated, based on the specific characteristics and needs of each academic unit and/or each course. They are completed electronically.

The evaluation is carried out under the responsibility of the Internal Evaluation Team (O.M.E.A.) of the JEUPS which consists of four (4) faculty members of the School of Mechanical Engineering, two (2) faculty members of the Department of Chemistry and one (1) faculty member of the School of Agriculture in collaboration with the Quality Management Unit of the Aristotle University of Thessaloniki, and is carried out through the latter's Quality Management Information System. The Administration and the O.M.E.A. of the Department must take systematic actions to ensure that the participation of students in the evaluation, in accordance with the guidelines of the Quality Assurance Unit and the relevant decisions of the Senate.

The O.M.E.A. of the JEUPS monitors, through the Quality Management Information System of the Quality Management Unit, the degree of participation of students in the evaluation process, analyzes the relevant results and informs the administrative bodies

of the JEUPS and the respective academic unit about them. The evaluation questionnaires concern the respective course taught and the respective teacher separately.

The governing bodies of the JEUPS and the academic unit, in collaboration with the corresponding O.M.E.A. of the JEUPS, must study the results of the evaluation, announce their conclusions, decide to publish the summary results of the evaluation, when deemed necessary and in any case after the announcement of the grades of the semester courses, in accordance with the applicable Legislation on the protection of Personal Data, and take actions to address any problems or improvement of the JEUPS

Article 15
Study Guide of D.X.P.P.S.

The JEUPS publishes a Study Guide in English in order to inform students about its operation. It is published on the Program's website and is updated at regular intervals. The Study Guide includes:

1. General Information as well as useful electronic information about the Institution and the School, in particular about administrative services or collective bodies that the undergraduate student can turn to for the successful completion of his/her studies.

2. The purpose, the subject of the JEUPS as well as the qualifications acquired after the award of the degree.

3. The academic calendar, which includes the start and end dates of academic semesters, examination periods, holidays and any other obligations such as seminars, conferences, etc.

4. The course schedule, credits, terms of study, teaching staff, rights and obligations of students.

5. The official language of instruction.

6. The Curriculum Committee of the JEUPS

7. Databases and other services.

8. Use of the Library, depending on the needs of the courses of the JEUPS

9. Learning outcomes and qualifications, after graduation.

10. Services of the Institution to students.

Article 16
Transitional arrangements

Any issue that arises during the operation of the JEUPS, which is not covered by the relevant legislation or the present Regulation, is dealt with by decisions of the Program's governing bodies, by amending the relevant Regulation.