

A. QUALITY OF PROJECT DESIGN AND COOPERATION ARRANGEMENTS

Ερώτημα Α (Σε επίπεδο Σχεδίου/για όλες τις προτάσεις συνεργασίας με ιδρύματα, 40 βαθμοί)

TUC is an outward looking HEI, whose main aim is to provide high-quality education to students and research opportunities to staff members, driven by excellence in research, teaching and innovation, through strong ties with international organizations that give complementarity and add to the excellence standard of the entire team. In 2016, the external Higher Education Evaluation committee ranked it amongst the 10 best achieving institutions in Greece. The same year, TUC submitted a successful application at the ICM Call. In the last 27 years has signed a significant number of MoUs, more than 100 Inter-Institutional Agreements under Erasmus program and has received and sent hundreds of international distinguished academics, scholars and students to and from European and non-European Universities (Israel, Jordan, U.S.A, China, Botswana, Canada, South Africa, Armenia, Ecuador, Laos, Serbia, Chile, India, New Zealand). After the end of the inter-institutional agreements, channels of cooperation are maintained either at the level of Faculties or at the level of research working groups between the partner Institutions. For this reason, the cooperation with the majority of the Institutions continues in the plans 2019-22 and 2020-3 within the framework of the international mobility program. Although the majority of the Institutions expressed interest in continuing the collaborations under the same program, the TUC in the new mobility plan (call 2022) gave priority to collaborating with new Institutions in the same educational fields in order to expand its global cooperation network on international issues.

Preparation for the submission of the cooperation proposal: The responsible persons for the implementation of the program are predetermined **in writing**, while pre-agreed the observance of the principles and procedures, as foreseen in the inter-institutional agreement. In the preliminary cooperation agreement both Institutions have defined: Erasmus management officers for the implementation of the program (TUC: Markos Ntoukakis/Erasmus office) and Inclusion Officers (TUC: Lefteris Maragkoudakis/Erasmus office) who undertake to reach out and increase accessibility to more participants with fewer mobility opportunities. In addition, Erasmus academic Institution coordinators (TUC: Prof. Michael Zervakis/**Vice Rector**) and the legally responsables for the conclusion of the inter institutional agreement (TUC: Prof. Evangelos Diamantopoulos /Rector). Erasmus Offices of the partner Institutions communicate with e-mail, skype, cloud storage services (Dropbox) for file sharing on the needs of the project. Basic parameters of the cooperation have been regulated, such as the procedures for the information of the academic communities and the invitation ways to participation in mobility, the selection criteria for applicants and the recommendation of the evaluation committee. In addition it is identified the educational field(s) of the project, the participating faculties from each Institution, the academic coordinators from each faculty (TUC: <https://www.tuc.gr/index.php?id=12861&L=928%27>) and academic calendars are exchanged (TUC: <https://www.tuc.gr/index.php?id=3624>). Specifically for student mobility (1st, 2st cycle) the Erasmus officers exchange information about the required language skills and the offered courses of each faculty (TUC: <https://www.tuc.gr/index.php?id=534&L=928%27>). Also, information is exchanged regarding the professors who can supervise thesis for students and for those who can contribute the activities of incoming staff, for the organizations that can employ students for traineeship and for the required language skills of incoming participants in each institution. After the mobility grant, each

Erasmus officer will post announcements on the official websites and social media accounts about the procedures and benefits of the Erasmus program. The Inclusion officers will post information about the possibilities, the criteria and the capabilities of the program for the support of vulnerable groups. At the same time, the Erasmus officers in collaboration with the academic coordinators of participating faculties of each Institution will relate the offered courses for the incoming Erasmus students. The inter-institutional agreement will then be checked by the Erasmus Institution Coordinator and be signed by the legal representative of each Institution. After the signing, the Erasmus officers and the Inclusion officers will post invitation on the media and sessions will be organized to inform the academic communities for the approved mobilities. The invitation to participate in the program for staff and students by the Erasmus officers will be composed in the pre-agreed way at the same time in both Institutions if this is possible for better control of the process. Applicant outgoing students from TUC evaluated by the motivation to participate in mobility, from their activities in the specific educational field, while priority will be given to students with fewer opportunities to participate in mobility. A point allocation system evaluate outgoing staff of TUC, based on the years of their employment at TUC, the time since the last participation in mobility and the submitted activity plan. Erasmus officer at the Partner Institution informs in writing the Erasmus office of TUC about the procedures of information, selection and evaluation of the candidates. In this way, TUC as the coordinator of the program ensures a selection process fair, transparent and documented, ensuring equal opportunities to participants eligible for mobility. Details for the pre-planning of the cooperation with each candidate Institution are given in in the corresponding section.

Before the mobility: The required arrangements in the Inter institutional Agreement to support the participants before the mobility for procedures related to visa, insurance, travel, accommodation, integration and linguistic support of students will be implemented in collaboration with the Erasmus officers and Inclusion officers of both Institutions. They are responsible to post information on the websites of their institutions about the above procedures and to provide administrative support and advice to participants. Incoming students at each Institution can receive additional information for the planning of their studies from the Erasmus academic coordinators of each faculty and from professors who specialize in the educational field of the cooperation and have stated that they can co-supervise their thesis. Incoming staff at each Institution can receive additional information from members of TUC who specialize in the same education field and have stated that they can contribute to their activities. In this way, the participants will have all the information for the planning of their activities in the mobility agreements. Incoming students to TUC can receive additional information about their stay in Chania from the Erasmus Student Network (ESN) at TUC

(<https://tuc.esngreece.gr/about-us>). The Inter-institutional agreement clearly states that TUC's Erasmus office will manage the OS and will be responsible for uploading and updating the Mobility Tool. Under the terms of the Erasmus Program, students will not be required to pay any tuition fees to the host Institution. TUC, as applicant and Coordinator, will be in charge for the financial management, conforming to the guidelines and policies of the European Commission and the National Agency (IKY). All grants and travel expenses of the Erasmus+ International Credit Mobility Program participants will be covered by the TUC. The data required for the signing of the grant agreement (visa, insurance contract, bank account, tickets) will be collected and checked by the Erasmus office of TUC. The prepayment (80%) will be granted to participants at least one month before the start of mobility. The disbursement of money and their deposit in the bank accounts of the participants is a responsibility of finance department of TUC, "Special Account for Research Funding–ELKE" (<https://www.elke.tuc.gr/en/home>) in collaboration with the Erasmus office of TUC.

During the mobility: In addition to the participant support procedures mentioned in the inter-institutional agreement, upon arrival of the grantees, TUC Erasmus Office will organize a campus-tour and a meeting in order to inform the applicants regarding the city, the transportation and the campus life. TUC will offer free the student ID card and full access to classic core ICT services (e.g. e-mails account, Wi-Fi, etc), to library, in campus sports installations, at meals and in public transport at low prices. TUC's Language Research and Resources Center contribute to the improvement of the linguistic skills of Greek students by offering free of charge lessons in English language and free lessons in Greek language to incoming students. Students and academic staff with physical disabilities have full access to all above activities and services. There are spacious elevators and parking facilities, so that all the physical barriers are eliminated and many laboratories are on the ground floor. TUC will integrate incoming students and staff by encouraging them to participate in students' associations and campus life, cultural activities and visits. The Erasmus academic coordinators of participating faculties will attend their studies in the courses provided in the learning agreements. An appointed team of Professors will co-supervise the progress of their dissertation and will also draw a final report at the end of their mobility period, in order to facilitate the recognition of the learning outcomes. Incoming students are expected to participate to presentations, seminars, conferences or other academic and scientific activities in order to diffuse the acquired and gained knowledge. Particularly important is the contribution of the Erasmus student association (ESN) for the integration of incoming students in community of TUC and in the social life of the city.

After the mobility: The original Certificate of Attendance that will be handed from the Erasmus officer of TUC will be the proof of recognition for the mobility period. Erasmus officer at the partner institution will be required to provide written recognition of the courses and postgraduate and doctoral studies (part of thesis) for TUC outgoing students. After the final check of all the presented documents, the participants will receive from ELKE the remaining 20% of the grant. After the end of mobility, participants have to submit the EU Report. The final reports in combination with the open-ended questionnaire to the participants are used to evaluate each mobility. In short, participants are asked if they have implemented the planned activities and if they are satisfied with the services (information, criteria for selecting participants, measures to support vulnerable groups) provided by Erasmus offices and academic coordinators from each institution before, during and after mobility. Every answer must be justified. The processing of the participants' reports in combination with the above questionnaire and the final evaluation of the project by the IKY are used as indicators for the evaluation of the project and are discussed in a special session of the Erasmus office contributes to the continuous improvement of the implementation of the mobility program. Participants' activities post on the Erasmus website and presented by them at an event organized by the Erasmus Office after the end of each mobility project, which is attended by the entire academic community. In this meeting, the participants discuss the benefits and potential problems that arose during the project and propose solutions to improve the planning and management of the mobility program.

B. RELEVANCE OF STRATEGY Ερώτημα Β (Σε επίπεδο Ιδρύματος, 40 βαθμοί)

The School of Chemical and Environmental Engineering (CHENVENG) of TUC and the Faculty of Agronomic Sciences of University of Abomey-Calavi (UAC) in Benin will participate at the proposed collaboration on the education fields "Environmental sciences" (ISCED code: 0521), "Chemical engineering and processes" (ISCED code: 0711) and "Environmental protection technology"(ISCED

code: 0712) in scientific areas “water and wastewater management and treatment”, “waste to energy”, and “contaminant transport in porous media”.

The University of Abomey-Calavi has a history of over 50 years and it is the first public university of higher education in Benin. UAC has more than 100 national and international partners with whom it collaborates in the field of the environment. UAC works with several European universities under ERASMUS program such as the University of Cordoba, University of

Las Palmas, the University of Malaga in Spain, University of Pegasso, University of Naples Federico 2 in Italy, University of Helsinki (Finland), University of Cluj Napoca; the Babès Bolyai University of Romania and the Technical University of Yildiz in Turkey.

TUC does not have any previous experience in managing of the same or related programs or projects with the UAC.

However, there have been previous collaborations of CHENVENG in the same educational fields with other Institutions in Africa (Botswana, South Africa) and in other countries (Jordan, USA, China, Canada, Armenia, Ecuador, Laos, Chile, New Zealand) under the international Erasmus program. The main purpose of this proposal is to create an international scientific network for cooperation on common environmental problems and on environmental protection technologies against climate change. Such cooperation initiatives have been attempted in the past by Prof. Petros Gikas of TUC and Prof. Achille Assogbadjo of UAC. Specifically, in 2019 and 2020, TUC and several other African universities, including UAC, submitted a proposal in the framework of the European Education and Culture Executive Agency (EACEA), entitled “Mobility For Advancing The Science of Plant Pathology In Africa (MASPA)”. Furthermore, in 2021 TUC and UAC submitted a joint research programme proposal for Horizon 2020, entitled AFR-ENERGY “Affordable energy for communities and small enterprises in Africa through sustainable. The above programs were not selected for funding. The ultimate aim of this cooperation is to establish scientific collaboration solving common vital environmental problems (water scarcity, desertification, waste management, and energy production) which will benefit the broad societies in their countries. TUC has a lot of experience on the fields of water and wastewater management and treatment, waste to energy, and contaminant transport in porous media. Selected or modified plants can contribute in the avoidance of seawater, freshwater, and underground water pollution and contamination. Furthermore, extracted sludge from wastewater could be used as fuel for the production of electrical and thermal energy, though anaerobic digestion (mainly methane) or gasification (mainly hydrogen) processes. Prof. Petros Gikas is currently working on a project for energy self-sustainable wastewater treatment process and biosolids management, implementing a gasifier for the production of hydrogen and carbon dioxide from wastewater sludge. Hydrogen could be used as a fuel for the production of electrical and thermal energy. Using these types of alternative fuels, could reduce the consumption of fossil fuels and limit the hazardous flue gases that are the main cause of global warming.

UAC and TUC have common challenges in the environmental problems and sustainable development. According to the Ministry of Living Environment and Sustainable Development, these challenges for Benin include, among others, incivism, poverty, degradation of the living environment and ecosystems, anarchic urbanization and the occupation of land unsuitable for habitation. Priority of the government action in Benin is already the "Increase the social well-being of the population in a sustainable manner" and the "Strengthen the balanced and sustainable development of the natural space". In line with this priority the “Interfaculty Center in Environment for Sustainable Development”, the “Multidisciplinary Doctoral School: Space, Culture and Development” and the "College of Energy, Infrastructure and Environment Engineering" at UAC offers several training courses at Bachelor, Master and Doctorate levels in the fields of “Environment, Health and Safety”,

"Environment, Health and Sustainable Development", in "Environmental Management", "Engineering Design Degrees" and in "Energy, Transport and the Environment". In collaboration with the Heph-Condorcet (Belgium) and in the framework of the development of partnerships with the European Academic Networks (GIS InREnT, Lab-network ULYSSE) UAC organized from 27 to 29 January 2021 a multidisciplinary international symposium "Tourism, Environment, Society and Sustainable Development". In addition, UAC involved in the funded project of Islamic Development Bank and World Academy of Sciences (ISDB-TWAS) entitled "Profiling and taming antibiotic resistant genes and antibiotic chemicals in drinking water for quality life" (Nigeria-Benin collaboration" which screens drinking water for antibiotic resistance genes and residues. UAC has also been interested in monitoring resistance genes in the environment, through the project "Occurrence, sources and prevention of antimicrobial resistance in west Africa – tracking the flow of antimicrobial resistance genes between humans, animals and the environment", funded by the academy of Finland 2018-2021 and conducted in partnership with the university of Helsinki and the Joseph Ki-Zerbo University of Burkina Faso. For the reasons above, there are laboratories at UAC equipped with state-of-the-art facilities that provide a suitable framework for teaching and research in the field of the Environment. UAC's faculty members and researchers, have several hundred publications, with a background, experience, institutional and academic assets that will be valued for the success of this mobility project.

Greece also faces major challenges in the environmental field. Examples are the illegal dumps that often border urban areas, the concrete constructions of the tourist coastlines, and the air pollution that can offend people's sensibilities and other problems, which certainly explain the creation of the School of CHENVENG at TUC.

TUC and UAC propose 4 outgoing mobilities by 2 staff members which will cover different environmental subjects. Each staff member will visit Benin twice. The duration of the proposed mobility is 5 activity days and 2 travel days each. Prof. Petros Gikas of TUC will provide lectures, specifically on the Design of Energy Positive Wastewater Treatment Plants, on Liquid and Solid Waste Management, on Water Resources Management, and on Water Reclamation and Reuse. Prof. Constantinos Chrysikopoulos will be teaching experimental as well as theoretical aspects of contaminant transport in porous media and environmental systems and will deliver lectures on Heat and Mass Transfer, and Biological Processes in Wastewater Treatment. Prof. Assogbadjo Achille Ephrem of UAC will teach courses on Conservation genetics, Forest ecology and Ethnobotany. Dr. Victorien Tamègnon Dougnon will teach Antimicrobial resistance in Africa, to molecular microbiology, hygiene and public health.

TUC propose one (1) 3rd cycle outgoing student who will carry out part of his/her thesis. The duration of the proposed mobility of 2 months is sufficient to carry out research activities, which would have been well prepared in advance. Two outgoing students of UAC (1st and 2nd cycle) will do a five-month stay for studies on the Erasmus offered courses. The 3rd cycle student will do a two-month stay at the TUC for preparation of part of thesis.

Adherence to the principles of the Inter institutional Agreement and the required procedures before, during and after mobility have been pre-agreed in writing.

Erasmus management officer at UAC: Dr. Victorien Dougnon, Head of the International Cooperation Office. Inclusion Officer: Mrs. Lydia Sognon at Department of Wellbeing and Psychological Support of Scholars. Academic coordinator of Erasmus: Prof. Achille Assogbadjo. Legal representative of the agreement: Prof. Félicien AVlessi, Vice-Chancellor of UAC. Professors Achille Assogbadjo and Romain Kakai Glele from the Faculty of Agronomic Sciences have stated that they can co-supervise the dissertation of incoming PhD student of TUC.

Prof. Bonaventure Ahohuendo (Dean of Faculty of Agronomic Sciences), Prof. Marcel Houinato (Director of Doctoral School of Agricultural and Water Sciences) and Prof. Achille Assogbadjo have stated that they can contribute to the activities of the 2 incoming staff members for teaching.

On the part of TUC, Academic coordinator of Erasmus program at CHENVENG, Prof. Paraskevi Panagiotopoulou can contribute to the activities of the 2 incoming students who intend to attend courses. Professors Petros Gikas, Constantinos Chrysikopoulos and the Working team of PhD Candidates Anthoula Manali, Georgios Makaroglou and Konstantinos Tsamoutsoglou have stated that they can co-supervise the dissertation of the PhD incoming student and contribute to the activities of the 2 incoming staff members for teaching.

Erasmus management officers of both Institutions have already been informed about the academic calendars. The recommended language skills for incoming participants at both Institutions is English/B2. During the mobility, the students will have the opportunity to enhance their skills in the local language through supportive courses. Explain how you expect that this project will contribute to new cooperation in education and/or research in the region: see: Impact (and dissemination)

C. IMPACT AND DISSEMINATION

Ερώτημα C (Σε επίπεδο ιδρύματος/20βαθμοί)

The target groups that will benefit from the project are the exchange participants, the faculties, young people engaged in digital transformation, both counties, the researchers and the industries in Environmental protection technologies.

- 1) For exchange students: Students will be more adaptable regarding the future employment and work. By working in the laboratories of the host Universities, they will enhance their creativity and promote scientific research on environmental issues that their county is facing and disseminate the acquired knowledge to their regions. Also, they will improve their communication and writing skills in English, and will interact and socialize with their fellow students. Students are expected to develop social and intercultural competences, critical thinking and media literacy. Especially, incoming applicants from UAC, will learn about the Greek culture, will participate in the democratic life, social and civic engagement through formal or non-formal learning activities with emphasis on raising awareness of and understanding the European Union context, notably as regards the common EU values.
- 2) For academic staff: Academic staff will have the opportunity to join forces with professors from the host University, to tackle environmental problems with viable and economic solutions. Such problems are: wastewater treatment, water and energy management, waste to energy, etc. Academic staff members from both Universities will become aware of the particular problems that Benin and Greece are facing, and will exploit the potential for further collaboration either in EU projects but also in projects initiated by local or national authorities (particularly on sanitation, water reuse, waste to energy, and contaminants transport in porous media).

Teaching staff will be benefited from this collaboration, by sharing scientific knowledge and teaching methods. The scientific results from the joint projects are expected to lead in common publications and conference presentations, thus informing the scientific community about current advances in environmental engineering.

- 3) For the Universities: The proposed mobility program, will strengthen the partnership of both universities, and bring added value by transferring and communicating good practices. Both

universities will benefit from such collaboration, as they will exchange ideas for the management of common hot environmental problems. TUC's educational system could be updated/modernized with new educational methods to train young engineers and help the academic community to acquire new skills. The scientific community of UAC could be enriched with new scientific inputs (articles, conferences, webinars) on Greece - Benin issues on wastewater treatment, energy production from waste and contaminants transport in porous media. TUC and UAC will increase their capacity to operate at EU/international level with improved management skills and internationalization strategies. The Mobility will also develop cultural/economic/academic relations with Program and Partner Universities, increase quality in the preparation; implementation and monitoring of Erasmus+ ICM program, and reinforce the scientific quality of its faculty members and students. A possible partnership agreement is envisaged between "The Interfacular Environmental Centre for Sustainable Development" from UAC and TUC.

4) For the researchers and the industries in Environmental protection technologies: The scientific community could be enriched with new scientific inputs (articles, conferences, webinars) on Greece - Benin issues on wastewater treatment, energy production from waste and contaminants transport in porous media. The collaboration could possibly aid in finding innovative solutions for the common issues mentioned above.

5) For the regional society and young people interested in digital transformation: TUC and UAC have both moved into Digital

Transformation, especially since the beginning of COVID-19 pandemic. They have developed e-learning practices, MOOCs, they have reduced paper prints and digitalized and simplified university services to avoid overcrowding. The planned mobility could enhance Digital Transformation, by delivering lectures through educational platforms, offering webseminars and web-conferences to students, updating university services for easier convenience of the faculty member and students. By using such services, members will practice and acquire new digital skills. Through their collaboration, the academic staff from both universities will modernize curricula, apply innovative methods, and improve lab analyses. 6) For both counties: At local level, participants will gain experience and linkages with other people, which can be used for future collaborations or job positions. At regional level, participants will raise awareness to other scientific members about the benefits of the mobility program and they will enhance their cultural and economic relations. At national level, both Universities will help countries to establish commercial and diplomatic connections, and set a common path for encountering challenges and barriers in Environmental Engineering. Moreover, the publicity of the visits is expected to enhance tourism between Benin and Greece, as the academics, students and colleagues may decide to return back to visit the host country along with their families or friends, particularly in Chania (Crete). It is remarkable that there is a big interest in Cretan local products such as dairy products, olive oil and herbs. That interest functions for the benefit of the local, regional and national economy. Immersion in the TUC will provide an insight into Greece's overall strategy for targeting environmental challenges and moving towards sustainable development. It is also an opportunity to learn about the country's efforts and challenges in the areas of digital transformation and democracy. For Benin, through its universities, is trying to train experts to target development challenges, including environmental challenges. Learning about pedagogical approaches, academic strategies, and the content of executive education in the field of the environment in Greece can be a source of inspiration for improving practices in Benin. Furthermore, with COVID-19, Benin has made considerable progress in the field of Digital Transformation, which has enabled it to develop, for example, an e-learning platform for students at the UAC. Such efforts are interesting, but the UAC, through this mobility, wishes to learn from the

practices of the TUC and Greece in the field of elearning, MOOCs and Digital Transformation, in order to improve practices in Benin. Finally, this mobility is an opportunity for Benin to understand how this democracy is operationalized in Greece and to see the positive points to be used. The international impact: The project will have impact in the scientific community, worldwide, through publications in scientific journals and conference presentations. Dissemination of the programme's results will raise awareness on environmentally friendly processes with low carbon footprint for wastewater treatment and energy production from waste sludge. The mobility may set the foundations for setting new environmental policy regulations. The exchanged knowledge in the field of Environmental Engineering could aid in upgrading existing treatment plants located in Benin, or even provide essential information in newly-constructed ones.

Digital transformation will simplify the dissemination of the programme's results, at a local, national and international level.

The Mobility programme will connect populations with different traditions. Such interaction among grantees with locals, will bring harmonious coexistence of nations with respect to different cultural practices and beliefs, which will contribute in the reduction of racism.

Measures for the dissemination of the results at the level of Institutions: The program's outcomes will be published on social media (Facebook, Twitter) and on TUC's website (www.tuc.gr). The Erasmus Office will raise awareness about the benefits of the Mobility and urge faculty members and students to apply for Erasmus+ ICM or similar exchange programmes. Grantees from both Universities, will share their experience through social media, meetings, conferences/web-conferences, and seminars/web-seminars. The program's results at UAC will be published on the website (www.uac.bj), the Facebook page, the twitter account, the Gmail broadcasting group, the web TV and the web radio, the billboards, as well as the university press.

Measures for the dissemination of the results at the level of Countries: Dissemination of the results will bring major benefits to Greece. Erasmus+ ICM will help Universities disseminate its opportunities at the national educational system and inform other Universities and Greek people in general through publications in local or national press and websites about the positive outcomes in participating in such mobility programs. Also, it will promote the openness of the local community towards people with such a different culture. In Benin, programme's results will be disseminated in national conferences, seminars, local or national press, and websites.

Measures for the dissemination of the results at international level: The international community is expected to benefit through the publication of articles in high-level scientific journals and peer-reviewed conferences, thus improving their curriculum vitae and academic profile, and strengthen their academic collaboration with other universities abroad. The results of the project will be shared with the international partners.