

## MODULE OUTLINE EPK63

### 1. GENERAL INFORMATION

<b>SCHOOL</b>	OF APPLIED ARTS AND SUSTAINABLE DESIGN		
<b>PROGRAM COURSE</b>	SUSTAINABLE INTERIOR DESIGN OF BUILDINGS (EPK)		
<b>LEVEL OF STUDY</b>	POSTGRADUATE		
<b>MODULE CODE</b>	EPK63	<b>SEMESTER OF STUDY</b>	3rd
<b>MODULE TITLE</b>	Comfort Conditions and Energy performance of A Building		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <i>in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits</i>		<b>HOURS</b>	<b>CREDIS</b>
Weekly teaching hours 21-23 hours x 13 weeks		<b>280-300</b>	<b>10 ECTS</b>
<b>COURSE TYPE</b> Compulsory, Optional, Optional mandatory	Elective		
<b>PREREQUISITE MODULES:</b>	None		
<b>LANGUAGE OF INSTRUCTION AND EXAMS</b>	Greek		
<b>THE MODULE IS OFFERED TO ERASMUS STUDENTS</b>	No (due to annual duration of the module)		
<b>MODULE WEBSITE (URL)</b>	<a href="https://www.eap.gr/en/viosimos-shediasmos/topics/#EPK63">https://www.eap.gr/en/viosimos-shediasmos/topics/#EPK63</a>  Each module has its own space in the Learning Management System of EAP ( <a href="https://courses.eap.gr/login/index.php">https://courses.eap.gr/login/index.php</a> ), with controlled access (use of code) for students and teaching staff.		

### 2. LEARNING OUTCOMES

<b>Learning Outcomes</b> <i>The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:</i>	
Upon successful completion of the Thematic Laboratory Unit, students will be able to: <ul style="list-style-type: none"> <li>Identify and familiarize with the main technical installations and attributes of a building</li> <li>Collect data on the comfort and function conditions of a building</li> <li>Calculate a building's energy intensiveness indicators</li> <li>Analyze and synthesize information and data drawn from various sources and processes</li> <li>Understand the requirements set forth in Regulations</li> <li>Adapt the theoretical and actual energy behavior of a building</li> <li>Evaluate the prevalent conditions in a building as well as its energy behavior</li> <li>Propose building comfort condition and energy behavior improvements</li> <li>Prepare a technical report.</li> </ul>	
<b>General Competences</b> <i>Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?</i>	
<i>Search for, analysis and synthesis of data and information by the use of appropriate technologies,</i> <i>Adapting to new situations</i>	<i>Project planning and management</i> <i>Respect for diversity and multiculturalism</i> <i>Environmental awareness</i> <i>Social, professional and ethical responsibility and</i>

<i>Decision-making</i>	<i>sensitivity to gender issues</i>
<i>Individual/Independent work</i>	<i>Critical thinking</i>
<i>Group/Team work</i>	<i>Development of free, creative and inductive thinking</i>
<i>Working in an international environment</i>	.....
<i>Working in an interdisciplinary environment (Other.....citizenship, spiritual freedom, social awareness, altruism etc.) .....</i>	<i>Introduction of innovative research</i>
<ul style="list-style-type: none"> <li>• Search for, analysis and synthesis of data and information by the use of appropriate technologies</li> <li>• Project planning and management</li> <li>• Environmental awareness</li> <li>• Adapting to new situations</li> <li>• Decision-making</li> <li>• Individual/Independent work</li> <li>• Critical thinking</li> <li>• Group/Team work</li> <li>• Working in an interdisciplinary environment</li> </ul>	

### 3. MODULE CONTENT

The TLU aims to:
1. Compile and synthesize data on the technical installations, construction, function and internal conditions of a residential or professional building
2. Evaluate the interior environment in combination with the actual and theoretical energy behavior of a building, to identify potential issues
3. Train students in the preparation of proposals to improve a building's interior environmental quality and energy efficiency.

### 4. TEACHING METHODS--ASSESSMENT

<b>MODES OF DELIVERY</b> <i>Face-to-face, in-class lecturing, distance teaching and distance learning etc.</i>	Distance education with three Group Counseling Meetings (OSS) during the academic year on weekends. Personal communication and feedback, where necessary (advisory role of SEP members)						
<b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</b> <i>Use of ICT in teaching, Laboratory Education, Communication with students</i>	<p>We use :</p> <p>Remote meetings tools (cisco webex), Presentation software (e.g. power point), Use of the TEE-KENAK calculation tool, for those who wish and have some relevant experience with its use. Conducting an electronic survey to collect data. Use of Excel spreadsheets to prepare graphics and an electronic word processor to prepare the technical report</p> <p>Additionally, the students use office automation tools, web browsers and e-reader for digital books.</p>						
<b>MODULE DESIGN</b> <i>Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational</i>	<table> <tr> <th><i>Activity</i></th><th><i>Annual Workload</i></th></tr> <tr> <td>3 OSS (x 4 hours)</td><td>12</td></tr> <tr> <td>2 tutorial exercises (2 x 30 hours)</td><td>60</td></tr> </table>	<i>Activity</i>	<i>Annual Workload</i>	3 OSS (x 4 hours)	12	2 tutorial exercises (2 x 30 hours)	60
<i>Activity</i>	<i>Annual Workload</i>						
3 OSS (x 4 hours)	12						
2 tutorial exercises (2 x 30 hours)	60						

<i>visits, projects, Essay writing, Artistic creativity, etc</i>  <i>The study hours for each learning activity as well as the hours of selfdirected study are given following the principles of the ECTS.</i>	Final Examination (Written examination or Final written assignment)	58
	Individual study (12-13 hours x 13 weeks)	150-170
	<b>Total module workload (hours)</b>	<b>280-300</b>
<b>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS</b> <i>Detailed description of the evaluation procedures.</i>  <i>Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work, other.....etc.</i>  <i>Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students</i>	Completion of educational activities during the academic semester which constitute a 40 percent of each student's grade. Final Examination (Written examination or Final written assignment), which constitute a 60 percent of the students' final laboratory course grade. For further information go to the <b><u>EAP Study Guide</u></b> .	

## 5. SUGGESTED BIBLIOGRAPHY

Κορωνάκη Ειρ., Αντωνάκος Γ., Δαλαβούρας Δ., Δαλαβούρας Π. (2023). Ψύξη - Κλιματισμός Κτηρίων και Βιομηχανικών Εφαρμογών. Θεσσαλονίκη: εκδ. Τζιόλα. ISBN: 978-960-418-526-9, σελίδες 856

Κατσαπρακάκης Δ., Μονιάκης Μ. (2015). Θέρμανση - Ψύξη - Κλιματισμός. ISBN: 978-960-603-339-1, σελίδες 690 Κάλλιπος, Ανοικτές Ακαδημαϊκές Εκδόσεις.

TOTEE 20701-1/2017. Αναλυτικές εθνικές προδιαγραφές παραμέτρων για τον υπολογισμό της ενεργειακής απόδοσης κτιρίων και την έκδοση του πιστοποιητικού ενεργειακής απόδοσης (σύμφωνα με την αναθεώρηση του Κ.ΕΝ.Α.Κ. 2017). Υπουργείο Περιβάλλοντος & Ενέργειας, ΤΕΕ.

T.O.T.E.E. 20701-4/2017. Οδηγίες και έντυπα ενεργειακών επιθεωρήσεων κτιρίων, συστημάτων θέρμανσης και συστημάτων κλιματισμού (σύμφωνα με την αναθεώρηση του Κ.ΕΝ.Α.Κ. 2017). Υπουργείο Περιβάλλοντος & Ενέργειας, ΤΕΕ.

Etheridge David (2011). *Natural ventilation of buildings: Theory , Measurements and Design*. John Wiley & Sons, Ltd. Print ISBN: 9780470660355, Online ISBN: 9781119951773 /DOI:10.1002/9781119951773, pages 456

*Natural ventilation in non-domestic buildings- a guide for designers, developers and owners (UK, DETR, Energy Efficiency Best Practice Programme, Good Practice Guide 237)*

*HVAC - Natural ventilation principles (A. Bhatia, Course No: M04-038 - CED Engineering)*

*Natural Ventilation lectures (Z. Magyar, Budapest University of Technology and Economics, Department of Building Energetics and Building Service Engineering)*

*Price Industries, Engineering Guide - Natural Ventilation (2011)*

*ASHRAE Advanced Energy Guides*

*ASHRAE Indoor Air Quality Guide: Best Practices for Design*

*ASHRAE Standard 62.1-2022, Ventilation and Acceptable Indoor Air Quality*

*ASHRAE Standard 62.2-2022, Ventilation and Acceptable Indoor Air Quality in Residential Buildings*

*P. Wargocki (2021). What we know and should know about ventilation, REHVA Journal, vol. 58(2): 5-13*

*R.P. Siegel, HVAC Systems are the Front Line in the Fight Against COVID-19 (9/3/2021) www.asme.org*

*Xiaojun Fan, et al. (2022). The effects of ventilation and temperature on sleep quality and next-day work performance: pilot measurements in a climate chamber, Building and Environment, vol. 209 [108666] <https://doi.org/10.1016/j.buildenv.2021.108666>*

*Lawson K. (2022). Practical Diffuser Selection and Layout Procedure, ASHRAE Journal, Vol. 64, Iss. 12: 50-58.*

*Johnson, R., Burroughs, C. (2022). ASHRAE Journal, Vol. 64, Iss. 12: 38-48.*

*Roulet C.A., Zuraïmi M.S., Sekhar S.C., & Tham K.W. (2006). Tracer gas measurement of airflow rates in spaces with several air-handling units, recirculation, or large time constants. HVAC&R Research, 12(3): 477-496.*

*Huai-Yu Zhong, et al. (2022). Single-sided natural ventilation in buildings: a critical literature review, Building and Environment, Vol. 212 [108797]*

*S. Omrani, V. Garcia-Hansen, B. Capra, R. Drogemuller (2017). Natural ventilation in multi-storey buildings: Design process and review of evaluation tools, Building and Environment, Volume 116: 182-194*

*Haihua Zhang, et al. (2021). A critical review of combined natural ventilation techniques in sustainable buildings, Renewable and Sustainable Energy Reviews, Volume 141 [110795]*

*Hussein M. Maghrabie (2022). A review of solar chimney for natural ventilation of residential and non-residential buildings, Sustainable Energy Technologies and Assessments, Volume 52, Part B [102082]*

*Fatemeh Jomehzadeh, et al. (2020). Natural ventilation by windcatcher (Badgir): A review on the impacts of geometry, microclimate and macroclimate, Energy and Buildings, Volume 226 [110396]*

*N.R.M. Sakiyama, J.C. Carlo, J. Frick, H. Garrecht (2020). Perspectives of naturally ventilated buildings: A review, Renewable and Sustainable Energy Reviews, Volume 130 [109933]*