Arhitektonski fakultet / Arhitektura - integrisane studije 5+0, (2017) / ENERGETSKI EFIKASNA ARHITEKTURA

Naziv predmeta:	ENERGETSKI EFIKASNA ARHITEKTURA			
Šifra predmeta	**Status predmeta**	**Semestar**	**Broj ECTS kredita**	**Fond časova** (P+V+L)
11000	Obavezan	8	4	2+2+0
Studijski programi za koje se organizuje	Arhitektura - integrisane studije 5+0, (2017)			
Uslovljenost drugim predmetima	Building Physics (Architectural Physics)			
Ciljevi izučavanja predmeta	Weekly 5.0 credits x 40/30 = 6 hours and 40 minutes Structure: 2 hours of lectures 2hour for tutorial 2 hours and 40 minutes of individual work, including consultations			
Ishodi učenja	It is expected that the student after passing the exam Energy efficiency in buildings: 1. Has knowledge of the principles of energy efficiency, particularly of the principles how architectural parameters dominantly influence energy efficiency of a certain building; 2. Has knowledge of the methods of analysis of energy needs for heating and cooling to enable the thermal comfort in certain climatic condidtions.			
Ime i prezime nastavnika i saradnika	During the semester Teaching and the final exam: (5 hours and 33 min) x 16 = 106 hours and 43 minutes Necessary preparations before the start of the semester (administration, registration, certification) 2 x (5 hours and 33 min) = 13 hours and 20 minutes Total hours for the course: 5.0x30 = 150 hours Additional hours: 31 hours and 57 minutes Structure of workload: 106 h and 43 min (lectures)+ 13 h and 20 min (preparation) + 21 h and 57 min (add. hours)			
Metod nastave i savladanja gradiva	Regular attendance of classes: 10 points (each one less cause failure point), maximum 3 absences - First test: maximum 15 points - Second test: maximum 15 points - Seminar work: maximum 40 points - Final exam: maximum 20 points ** Passing grade is obtained if the student achieved at least 51 points. - Rating: A (90-100) B (80-89) C (70-79) D (60-69) E (50-59), F (below 50 points).			
Plan i program rada				
Pripremne nedjelje	Priprema i upis semestra			
I nedjelja, pred.	Introductory lecture: concepts, objectives, European legislation and regulation: directives and standards (EN and ISO)			
I nedjelja, vježbe	Semester report on energy efficiency of buildings: Graphical part - architectural contributions			
II nedjelja, pred.	State of the art at the national level: established level of the application of thermal protection in practice, national legislation and regulations for energy efficiency (EE)			
II nedjelja, vježbe	Semester report on energy efficiency of buildings: Graphical part - architectural contributions			
III nedjelja, pred.	The concept of energy efficiency of buildings: the characteristics of the building envelope and energy needs for heating and cooling, the other forms energy use in buildings: Sanitary hot water, lighting			
III nedjelja, vježbe	Semester report on energy efficiency of buildings: Calculation of the required heat energy for heating - Calculation of heat transfer coefficient "U"			
IV nedjelja, pred.	Energy model of the building - energy losses and gains: transmission and ventilation losses, gains through envelope (solar gains) and internal gains			
IV nedjelja, vježbe	Semester report on energy efficiency of buildings: Calculation of the required heat energy for heating - Calculation of heat transfer coefficient "U"			
V nedjelja, pred.	Thermal insulation of envelope elements - heat transfer coefficient (EN ISO 6946), the specific aspects: thermal bridges, European and national standards (EN, ISO and MEST)			
V nedjelja, vježbe	Semester report on energy efficiency of buildings: Calculation of the required heat energy for heating - Calculation of heat transfer coefficient "U"			
VI nedjelja, pred.	Glazed parts of envelope - windows and doors and infiltration, leakage radiation, low emission glass (Low E)			
VI nedjelja, vježbe	Semester report on energy efficiency of buildings: Calculation of the required heat energy for heating - Calculation of heat transfer coefficient "U"			
VII nedjelja, pred.	Energy model of the building: climate and climatic zones in Montenegro, the average meteorological year, degree - day, heating and cooling			
VII nedjelja, vježbe	Semester report on energy efficiency of buildings: Calculation of the required heat energy for heating - Calculation of heat transfer coefficient "U"			
VIII nedjelja, pred.	1st TEST (colloquium)			

VIII nedjelja, vježbe	1st TEST (colloquium)
IX nedjelja, pred.	Sanitary hot water
IX nedjelja, vježbe	Semester report on energy efficiency of buildings: Calculation of the required heat energy for heating - Calculation of heat gains (internal and external)
X nedjelja, pred.	Lighting, basic lighting parameters, units, types of lamps
X nedjelja, vježbe	Semester report on energy efficiency of buildings: Calculation of the required heat energy for heating - Calculation of heat gains (internal and external)
XI nedjelja, pred.	The algorithm of calculating of energy consumption in buildings according to EN 12379
XI nedjelja, vježbe	Semester report on energy efficiency of buildings: Calculation of the required heat energy for heating - Calculation of heat gains (internal and external)
XII nedjelja, pred.	Regulations for Energy Efficiency in Buildings
XII nedjelja, vježbe	Semester report on energy efficiency of buildings: Calculation of the required heat energy for heating - Balance of the total required energy for heating - Usable part of solar thermal gains - Continuous and non-continuous heating mode
XIII nedjelja, pred.	Software packages - Software
XIII nedjelja, vježbe	Semester report on energy efficiency of buildings: Calculation of the required heat energy for heating - Balance of the total required energy for heating - Total and specific required energy for heating - Illustrations of the structure of heat losses and gains
XIV nedjelja, pred.	2nd TEST (colloquium)
XIV nedjelja, vježbe	2nd TEST (colloquium)
XV nedjelja, pred.	FINAL EXAM
XV nedjelja, vježbe	FINAL EXAM
Opterećenje studenta	During the semester Teaching and the final exam: (5 hours and 33 min) x 16 = 106 hours and 43 minutes Necessary preparations before the start of the semester (administration, registration, certification) 2 x (5 hours and 33 min) = 13 hours and 20 minutes Total hours for the course: 5.0x30 = 150 hours Additional hours: 31 hours and 57 minutes Structure of workload: 106 h and 43 min (lectures)+ 13 h and 20 min (preparation) + 21 h and 57 min (add. hours)

Nedjeljno	**U toku semestra**
4 kredita x 40/30=5 sati i 20 minuta 2 sat(a) teorijskog predavanja 0 sat(a) praktičnog predavanja 2 vježbi **1 sat(a) i 20 minuta** samostalnog rada, uključujući i konsultacije	Nastava i završni ispit: **5 sati i 20 minuta x 16 =85 sati i 20 minuta** Neophodna priprema prije početka semestra (administracija, upis, ovjera): **5 sati i 20 minuta x 2 =10 sati i 40 minuta** Ukupno opterećenje za predmet: **4 x 30=120 sati** Dopunski rad za pripremu ispita u popravnom ispitnom roku, uključujući i polaganje popravnog ispita od 0 do 30 sati (preostalo vrijeme od prve dvije stavke do ukupnog opterećenja za predmet) **24 sati i 0 minuta** Struktura opterećenja: **85 sati i 20 minuta (nastava), 10 sati i 40 minuta (priprema), 24 sati i 0 minuta (dopunski rad)**
Obaveze studenta u toku nastave	Weekly 5.0 credits x 40/30 = 6 hours and 40 minutes Structure: 2 hours of lectures 2hour for tutorial 2 hours and 40 minutes of individual work, including consultations
Konsultacije	
Literatura	- Pravilnici za energetsku efikasnost, Ministarstvo ekonomije CG, Podgorica, 2013. - "Energetska efikasnost zgrada - Metodologija energetskog pregleda i proračuna indikatora EE, Mašinski fakultet i Arhitektonski fakultet, Podgorica 2011. - Zbašnik Senegačnik M.: “Pasivna kuća”, SUN ARH doo, Zagreb, 2009. - Neufert E.: “Arhitektonsko projektovanje”, Građevinska knjiga, Beograd, 1996.
Oblici provjere znanja i ocjenjivanje	less cause failure point), maximum 3 absences - First test: maximum 15 points - Second test: maximum 15 points - Seminar work: maximum 40 points - Final exam: maximum 20 points ** Passing grade is obtained if the student achieved at least 51 points. - Rating: A (90-100) B (80-89) C (70-79) D (60-69) E (50-59), F (below 50 points).
Posebne naznake za predmet	Control by the University, the control of the teaching process by the faculty, the list of presence of students, analysis of the degree of transience (quality management system in accordance with ISO 9001).

Napomena			The tutorials are performed in groups of 2 - 3 students. If it is necessary, classes might be taught in English. Further information about the subject can be obtained from the course teacher.			
Ocjena:	F	E	D	C	B	A
Broj poena	manje od 50 poena	više ili jednako 50 poena i manje od 60 poena	više ili jednako 60 poena i manje od 70 poena	više ili jednako 70 poena i manje od 80 poena	više ili jednako 80 poena i manje od 90 poena	više ili jednako 90 poena