


Discipline	Thermal Engineering Measurements and Devices code: 37 winter semester		
Specialty	Thermal Engineering		
ECTS credits: 5	Form of assessment: exam		
Lecturer	Assoc. professor Ph D / scientific title/ Iliya Hadzhidimov /name/ Room 409M Phone: +359 52 383 428 E-mail: i_hadzhidimov@tu-varna.bg		
Department	Thermal Engineering and Technology		
Faculty	Shipbuilding		
<p>Students will gain understanding of the modern methods of thermal measurement with electronic facilities. For this purpose, special attention about analog to digital and digital to analog conversion has been paid, also to different electronic boards. Students will be able to construct and use digital and analog thermometers, sensors for pressure and relative humidity of the air, mass flow. Part of this subject is exploitation of weather stations and mastering their own. At the beginning of the course, students will get some knowledge about errors handling in measurement processes.</p>			
CONTENTS:			
Training Area		Hours lectures	Hours laboratory exercises

Errors of measurement	3	3
Analog to digital conversion, electronic boards, Arduino platforms	4	4
Analog and digital thermometers, Thermistors, DS18B20	4	4
Atmospheric pressure measurement, BMP085, BME280	2	2
Relative humidity measurement, DTH21	2	2
Wind velocity sensors. Cube anemometers	2	2
Water mass rate measurement, Hall sensors	2	2
Solar radiation sensor, pyranometers, silicon sensors, photo diode BPW34	4	4
Whether stations	3	3
Data transfer protocols, wired and wireless data transfer	4	4
TOTAL: 60 h	30 h	30 h