

*Course name*                    **Specializing Module:**                    *Code* **V.11**                    *Credit*    **3**  
**Heat and mass transfer**                    *points*

*Language of instruction*    **English**

*Programme*                    Computer Modelling and Simulation, Intelligent Energy, Business and Technology, Biotechnology for Environmental Protection

*Type of studies*

*Unit running the programme*                    Department of Heating, Ventillation and Atmosphere Protection.

*Course coordinator and academic teachers*                    **Prof. W. NOWAK**  
Prof. W. NOWAK (Lec.), T. CZAKIERT, Ph.D. (Tut.)

*Form of classes and number of hours*

Semester	Lec.	Tut.	Lab.	Proj.	Sem.	Credit points
V	30	15	-	-	-	3

*Learning outcomes*                    Fundamental knowledge of the heat and mass transfer: convection, conduction, radiation, diffusion and mixing

*Prerequisites*                    Basic knowledge of chemistry, mathematics and physics.

*Course description*                    Introduction. Steady state conduction. Unsteady state conduction. Principles of convection. Natural convection systems. Forced convection heat transfer. Radiation heat transfer. Condensation and boiling heat transfer. Heat exchangers. Mass transfer. Diffusion and mixing. Special topics in heat transfer.

TUTORIALS:  
see lecture content

LABORATORY  
Not applicable

PROJECT  
Not applicable

SEMINAR

Not applicable

*Form of assessment*      Written colloquium / exam

*Basic reference materials*      J.P. Holman, Heat Transfer – part 1 and part 2, Energy Engineering materials of the Tempus Project, S\_JEP-12255-97, Czestochowa University of Technology

*Other reference materials*

- Wiśniewski S., Wiśniewski T.S.: Wymiana ciepła. WNT, Warszawa 1994.
- Hobler T.: Ruch ciepła i wymienniki. WNT, Warszawa 1971.
- Brodowicz K.: Teoria wymienników ciepła i masy. PWN, Warszawa 1982.
- Staniszewski B.: Wymiana ciepła – podstawy teoretyczne. PWN, Warszawa 1979.
- Kostowski E.: Przepływ ciepła. Wydaw. Politechniki Gliwickiej, Gliwice 1995

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Average student workload (teaching hours + individ )	4 hours of teaching hours + 4 hours of individual work per week
Remarks:	
<i>Updated on:</i>	