Title of the module	**Cell physiology of marine organisms: cellular energy budget and metabolic fingerprinting**		
Term/semester	Summer term / 2		
VAK-Number	02-317-8-443		
Credit points	6 ECTS		
Compulsory/elective course	Elective course		
Teaching methods	Method	SWS	CP
	Lecture Seminar Lab course	1 (12h) 2 (24h) 4 (48h)	0.2 2.2 3.6
Self studies	protocol 30 hours preparation of the talk 20 hours learning for the exam 40 hours		
Module representative	Dr. Gisela Lannig & Dr. Christian Bock		
Instructor	Dr. Gisela Lannig & Dr. Christian Bock		
Examiner	Dr. G. Lannig & Dr. C. Bock		
Objectives	- Improving the knowledge on cell physiology, in particular, impact of environmental factors such as temperature on cell metabolism of marine ectothermal organisms - Conceptual development of experiments - Performing in vivo experiments on freshly isolated cells/tissue - Quantification of cellular processes (ATP-synthesis, protein synthesis) - Identification and quantification of a selective number of metabolites to detect changes from “normality” (metabolic fingerprinting)		
Content of teaching	Deepening the knowledge of cell physiology of marine ectotherms. Topics will be: - Environmental impact on function of cells and mitochondria - Aerobic and anaerobic energy metabolism - Analytical NMR techniques - Cellular energy budget and metabolite status Methods being used will be - Isolation and preparation of primary cells/tissue samples - Respirometry (closed and flow-through systems) - Photometry - Nuclear Magnetic Resonance (NMR) spectroscopy		
Learning results	- Understanding the principles of cell metabolism under physiological control and stress conditions - Ability to conduct and perform scientific experiments - Skills to conduct NMR spectroscopy (isolated cells/tissue, extracts) - Understanding and evaluate scientific data - Ability to present and discuss scientific data		
Control of the learning progress	Seminar talk and protocols		
Grading	Seminar talk (20%); Protocols (30%); Final exam (50%)		
Frequency	Each summer semester		
Use in other study courses	The modul is also provided to students of “Marine Biology”		
Requirements	Successful attendance in the required modules		