Course Title	**PHYSICS OF HOT AND COMPRESSED NUCLEAR MATTER**				
Course Code	**PHY 658**				
Course Type	Elective				
Level	Graduate				
Year / Semester	2nd year / 3rd semester of graduate studies				
Teacher's Name	Haralambos Tsertos				
ECTS	10	Lectures / week	2 (2 hours each)	Laboratories / week	
Course Purpose and Objectives	This specialization's reading course is offered to postgraduate students, who are intended to accomplish a Master or Ph.D. thesis in the area of experimental nuclear and particle physics. The main objective of the study is the spectroscopy of dileptons and vector mesons in heavy-ion collisions at relativistic energies, where conditions of hot and compressed nuclear matter may appear.				
Learning Outcomes	The student acquires systematic experience on: Conditions of creation in the laboratory of hot and dense nuclear matter after heavy-ion collisions at relativistic energies, chiral symmetries and their possible breakdown and restoration in a dense and hot hadronic environment, production of particles and resonances close to their energy production threshold, techniques for detecting dileptons and pions in heavy-ion collisions.				
Prerequisites	None	Required	None		
Course Content	1. Creation of hot and compressed nuclear matter in heavy-ion collisions at relativistic energies 2. Chiral dynamic of Quantum Chromodynamics (QCD) 3. Chiral symmetries 4. Breakdown and restoration of chiral symmetries in an environment of hot and compressed hadronic matter 5. Experimental signature of chiral symmetry restoration in heavy-ion collisions 6. Particle and resonance production close their production energy threshold 7. Production of vector mesons in a hadronic environment 8. Production and spectroscopy of dileptons in heavy-ion collisions				
Teaching	A detailed bibliography is provided for each chapter of the curriculum under				

Methodology	consideration and is thoroughly discussed with the student before the transition to the next chapter.
Bibliography	1. "Hadrons in Dense Matter and Hadrosynthesis ", Jean Cleymans, Hendrick B. Geyer, and Frederick G. Scholtz (Eds), Lectures Notes in Physics, Springer 2. "Probing the Nuclear Paradigm with Heavy-Ion Reactions", R.A. Broglia, P. Kienle, and P.E. Bortignon (Eds), International School of Heavy Ion Physics, World Scientific 3. "Hadronic and electromagnetic probes of hot and dense nuclear matter", W. Cassing and E.L. Bratkovskaya, Physics Reports 308, 65-233 (1999) 4. "Introduction to Chiral Symmetry", Volker Koch at nucl-th/9512029 (1995)
Assessment	One midterm oral examination and one final presentation examination
Language	Greek/English (depending on the audience).