COURSE SYLLABUS

University	**Alexandru Ioan Cuza University of Iaşi**	**Course title**	
Faculty	**Physics**	**PHYSICAL PROCESSES IN SEMICONDUCTORS STRUCTURES**	
Department	**Physics**		
Domain	**Physics**	**Course category** (FC/SC/CC[1]): FC	**Term** (1-4): 1
Level	**Postgraduate (MA)**	**Course type** (Co/El/F[2]): Co	

I. Course structure

Number of hours/week				Credits	Total class hours/ semester	Total hours of individual activity	Examination type (C/Ex/CE[3])	Teaching language
Course	Seminar	Lab.	Project	**6**	**56**	**124**	**Ex**	**English**
2	**-**	**2**	**-**					

II. Instructors

	Academic degree[4]	Scientific degree	Name and surname	Faculty position (tenure/ associate - organization)
Course	Associate professor	PhD	George Mihail RUSU	tenure
Seminar	-	-	-	-
Laboratory	Associate professor	PhD	George Mihail. RUSU	tenure

III. Prerequisites

Solid Sate Physics, Statistical Physics

IV. Course objectives

The aim of the course to study theoretical and applied physical phenomena in semiconductors and semiconducting structures (M-S, MIS, S-S junctions both in thin films and multilayered structures). Also, the main devices built up based on these structures will be investigated.

V. Course content

Course	1. Basic properties of semicondutors. 2. Surface and interface phenomena. 3. Physical processes in metal-semiconductor structures. 4. Analisis of the metal-oxide-semiconductor structures. 5. Physical processes in semiconductor junctions (semiconductor homo- and heterojunctions). Energy band diagrams. Theoretical aproaches. 6. Models for transport phenomena in semiconductor junctions. 7. Optical and photoelectrical phenomena in semiconductor junctions. 8. Preparation and characterization of semiconducting microstructures. Applications (heterojunction lasers, photodetectors, etc).
Seminar	–
Laboratory	1. Obtaining of the semiconducting thin films. 2. Measurement of the characteristic parameters of semiconducting materials. 3. Determination of metal-semiconductor potential energy height. 4. Preparation of semiconducting heterostructures. 5. Study of the current-voltage characteristics of semiconductor junctions. 6. Determination of some characteristics parameters based on C-V curves. 7. Study of the photovoltaic effect in some semiconductor structures. 8. Determination of life time of the carriers.

VI. Minimal required references

1. V. DOLOCAN, Fizica Joncţiunilor cu semiconductoare, Ed. Acad. R. S. R., Bucureşti, 1982.

[1] FC – fundamental course, SC – specialty course, CC – complementary course
[2] Co – compulsory, El – elective, F – facultative
[3] C – colloquium, Ex – exam, CE – colloquium AND exam
[4] Professor / Associate professor / Lecturer / Assistant professor / Teaching assistant

2. M. JAROS: Physics and Applications of Semiconductor Microstructures, Oxford Science Publications, 1989
3. MILNES A.G., FEUCHT D.L. :Heterojunctions and Metal-semiconductors Junctions, Academic Press N.Y.1972
4. I.DIMA, I. LICEA, Fenomene fotoelectrice în semiconductori şi aplicaţii, Ed. Acad. R. S. R., Bucureşti, 1980.

VII. Didactic methods

didactical demonstration, systemic exposure, conversation, media presentation

VIII. Assessment

Pre-conditions	attendance, active participation to class activities	
Exam dates	**1st Assessment**	November
	2nd Assessment	January

	Assessment means and methods	**Percentage of the final grade**
Exam/Colloquium	written	60%
Seminar	–	
Laboratory	practical work and project	40%