FIŞA DISCIPLINEI

Universitatea	**UNIVERSITATEA DE VEST TIMISOARA**
Facultatea	**FIZICA**
Specializarea	**AEPCP (master)**

I.

Denumire disciplină	Complements of Theoretical Physics

II.

Structură disciplină (Nr. ore săptămânal)							
Cod disciplină	Semestrul[2)]	Categoria[3)]	Credite	Curs	Seminar	Laborator	Proiect
AP 1101	**1**	**DF**	**7**	**2**	**2**		

III.

Statut disciplină	Obligatorie	Opţională	Facultativă
	x		

IV.

Titular disciplină				
	Curs	Seminar	Laborator	Proiect
Numele şi prenumele	**Ion Cotaescu j.r.**	**Ion Cotaescu j.r.**		
Instituţia	**UVT**	**UVT**		
Catedră/Departament	**FIZICA/FIZICA**	**FIZICA/FIZICA**		
Titlul ştiinţific	**Doctor**	**Doctor**		
Gradul didactic	**Lector**	**Lector**		
Încadrarea (norma de bază/asociat)	**Lector**	**Lector**		
Vârsta	**52**	**52**		

V.

Course objectives: Completion of students' knowledge in the field of Theoretical Physics. Accumulation of notions and knowledge to help them understand the phenomena and calculations that occur during the master's degree.

VI.

Conţinutul disciplinei	**Nr hours/week**
VI.1. Course	
1. Introduction. Development of different branches of physics and the object of study of the course.	**2/1 week**
2. Newtonian mechanics. Notions of rigid solid mechanics, moments of inertia, symmetry.	**4/2 weeks**
3. Theoretical mechanics. Lagrange and Hamilton equations, the principle of minimum action, conservation laws.	**4/2weeks**
4. Quantum mechanics. Schrodinger equation. Principles of quantum mechanics, operators and eigenvalues.	**4/2 weeks**
5. The spine and its own magnetic moment.	**4/2 weeks**
6. Elements of perturbation theory.	**6/3 weeks**

7. Lorentz transformations and special relativity.	**4/2 weeks**
VI.2. Seminar	
1. Inertial reference systems, Galileo transformations, coordinate systems.	**2/1 week**
2. The problem of the two bodies, the movement in the central field, conservation laws.	**4/2 weeks**
3. Harmonic oscillator.	**4/2 weeks**
4. Hydrogen atom, quantum numbers.	**4/2 weeks**
5. ½ Spin, Schrodinger-Pauli equation.	**4/2 weeks**
6. Some calculations of perturbations to simple stationary systems.	**4/2 weeks**
7. Diamagnetism and paramagnetism.	**2 /1 week**
8. Theory of special relativity problems.	**4/2 weeks**
VI.3. Lucrări de laborator (dacă este cazul)	
VI.4. Tematică proiect (dacă este cazul)	

VII.

Bibliografie
1. Serban Titeica, Mecanica Cuantica (Editura Academiei R.S.R. 1984). 2. A. Messiah, Mecanica Cuantica (Editura Stiintifica 1973). 3. I Cotaescu, Curs de mecanica cuantica (Tipografia Universitatii din Timisoara 1990). 4. Arno Bohm, Quantum Mechanics (Springer-Verlag 1994) 5.Viorica Florescu, Tudor Marian, Mircea Zaharia, Probleme de Mecanica Cuantica (Univ. Bucuresti 1986) 6. L. Landau, E.M. Lifsit, Mecanica cuantica. (Editura Tehnica, Bucuresti 1968) .

VIII.

Modul de transmitere a informatiilor	
Forme de activitate	**Metode didactice folosite**
Curs	online, google Meet si Classroom (se va comunica studentilor adresa)
Seminar	fata in fata, tabla, proiector video.
Laborator	
Proiect	

IX.

Evaluare		
Forme de activitate	**Evaluare**	**% din nota finală**
Examen	Examen- Lucrare scrisa tip grila, pentru nota minima se vor comunica subiectele	50%
Seminar	Portofoliu de referate si probleme, pentru nota minima se vor comunica cerintele.	50%
Laborator		
Proiect		
Skills acquired by the student: Knowledge and understanding of discipline-specific phenomena, training and development of theoretical skills to solve specific problems and to interpret correctly and completely the results, practicing teamwork and the ability to organize and investigate, cultivating a scientific environment based on values, ethics professionalism		

and quality, are just a few arguments that motivate the usefulness of this discipline for the training of a future physicist.

Data:
14.09.2022

Titular curs,
lector dr. Ion Cotaescu j.r.

DIRECTOR DE DEPARTAMENT,
Conf.univ.dr.habil. C.N.Marin

UNIVERSITATEA DE VEST DIN TIMISOARA
Facultatea de Fizică