SYLLABUS

1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty[1]/ Department [2]	Chemical Engineering, Biotechnologies and Environmental Protection / CAICAM
1.3 Field of study (name/code[3])	Chemical Engineering / 10.30.50
1.4 Study cycle	License
1.5 Study program (name/code/qualification)	Chemical Engineering / 10.30.50.60 / engineer

2. Information about the discipline

2.1 Name of discipline/ formative category[4]			Coordination and organometallic chemistry / DS				
2.2 Coordinator (holder) of course activities			Associate Professor Eng. Raluca Vodă .				
2.3 Coordinator (holder) of applied activities[5]			Associate Professor Eng. Raluca Vodă				
2.4 Year of study[6]	II	**2.5** Semester	3	**2.6** Type of evaluation	E	**2.7** Regime of discipline[7]	DI

3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted) [8]

3.1 Number of fully assisted hours / week	2 of which:	**3.2** course	1	**3.3** seminar / laboratory / project	0/1/0
3.1* Total number of fully assisted hours / semester	28 of which:	**3.2*** course	14	**3.3*** seminar / laboratory / project	0/14/0
3.4 Number of hours partially assisted / week	of which:	**3.5** training		**3.6** hours for diploma project elaboration	
3.4* Total number of hours partially assisted / semester	of which:	**3.5*** training		**3.6*** hours for diploma project elaboration	
3.7 Number of hours of unassisted activities / week	1.57 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			0.57
		hours of individual study after manual, course support, bibliography and notes			0.5
		training seminars / laboratories, homework and papers, portfolios and essays			0.5
3.7* Number of hours of unassisted activities / semester	22 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			6
		hours of individual study after manual, course support, bibliography and notes			8
		training seminars / laboratories, homework and papers, portfolios and essays			8
3.8 Total hours / week [9]	3.57				
3.8* Total hours /semester	50				
3.9 Number of credits	2				

4. **Prerequisites** (where applicable)

4.1 Curriculum	• Chemistry I, Chemistry II
4.2 Competencies	• Description, analysis and use of fundamental concepts and theories in the field of

[1] The name of the faculty which manages the educational curriculum to which the discipline belongs
[2] The name of the department entrusted with the discipline, and to which the course coordinator/holder belongs.
[3] The code provided in HG - on the approval of the Nomenclature of fields and specializations / study programs, annually updated.
[4] Discipline falls under the educational curriculum in one of the following formative disciplines: Basic Discipline (DF), Domain Discipline (DD), Specialist Discipline (DS) or Complementary Discipline (DC).
[5] Application activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).
[6] Year of studies in which the discipline is provided in the curriculum.
[7] Discipline may have one of the following regimes: imposed discipline (DI) or compulsory discipline (DOb)-for the other fundamental fields of studies offered by UPT, optional discipline (DO) or optional discipline (Df).
[8] The number of hours in the headings 3.1 *, 3.2 *, ..., 3.8 * is obtained by multiplying by 14 (weeks) the number of hours in headings 3.1, 3.2, ..., 3.8. The information in sections 3.1, 3.4 and 3.7 is the verification keys used by ARACIS as: (3.1) + (3.4) ≥ 28 hours / wk. and (3.8) ≤ 40 hours / wk.
[9] The total number of hours / week is obtained by summing up the number of hours in points 3.1, 3.4 and 3.7.

	engineering sciences • Theoretical grounding in solving the specific problems of the field with the use of established principles and methods

5. Conditions (where applicable)

5.1 of the course	• Medium-sized room, support materials: laptop, projector, blackboard.
5.2 to conduct practical activities	• Laboratory with specific equipment, computer, blackboard.

6. Specific competencies acquired through this discipline

Specific competencies	• •
Professional competencies ascribed to the specific competencies	• - Analyse production processes for improvement; • - Manage chemical testing procedures; • - Test materials; • - Write technical reports • -Performs chemical experiments • -Approve engineering design • -Assess environmental impact

Transversal competencies ascribed to the specific competencies

- - Conduct quality control;
- - Apply scientific, technological and engineering knowledge;
- - Uses equipment, instruments or technological equipment accurately.

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7. Objectives of the discipline (based on the grid of specific competencies acquired - pct.6)

7.1 The general objective of the discipline	• Acquisition of basic notions, concepts, theories and basic models in the field of coordination and organometallic chemistry.
7.2 Specific objectives	• Acquisition of elementary concepts of coordination and organometallic chemistry (nomenclature, coordination geometries, chemical bond in coordination and organometallic compounds, isomerism of coordination compounds, general methods of preparation) • Acquiring knowledge about the stages that must be completed in the synthesis of coordination and organometallic compounds

8. Content [10]

8.1 Course	Number of hours	Teaching methods [11]
1. Coordinative compounds: the chemical bond in the coordinative compounds, criteria for assessing the strength of the	2	Lecture, PPT presentations,

[10] It details all the didactic activities foreseen in the curriculum (lectures and seminar themes, the list of laboratory works, the content of the stages of project preparation, the theme of each practice stage). The titles of the laboratory work carried out on the stands shall be accompanied by the notation "(*)".

[11] Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).

coordinative σ bond		conversations, examples, explanations.
2. Coordination geometry and isomerism of coordination compounds	2	
3. Nomenclature and classification of organometallic compounds	1	
4. Methods of synthesis of organometallic compounds	2	
5. Organometallic compounds of elements from groups 1, 2, 12, 13	3	
6. Organometallic compounds of elements from groups 14-16	2	
7. Organometallic compounds of transition metals	2	
Bibliography [12] 1. M. Niculescu, R. Dumitru (Vodă), Reactions of inorganic substances. Principles and applications, Politehnica Publishing House, Timisoara, 2008. 2. D. Astruc, Organometallic Chemistry and Catalysis, Springer Science & Business Media, 2007. 3. S. Komiya, Synthesis of Organometallic Compounds: A Practical Guide, John Wiley &Sons Ltd, England, 1997.		
8.2 Applied activities [13]	Number of hours	Teaching methods
Laborator	14	Discussing the theoretical aspects of the works, conversations, explanations, experimental determinations; interpretation of the results.
1. Synthesis of some polynuclear coordination compounds through the oxidation reaction of ethylene glycol by metal nitrates, in a weak acid environment	2	
2. Characterization of the synthesized coordination compounds	4	
3. Thermal decomposition of complexes	2	
4. Obtaining nanooxides by calcining coordination compounds and their characterization	4	
5. Synthesis of an organomagnesium derivative and its use in the reaction with a ketone	2	
Bibliography [14] 1. M. Niculescu, R. Dumitru (Vodă), Reactions of inorganic substances. Principles and applications, Politehnica Publishing House, Timisoara, 2008. 2. D. Astruc, Organometallic Chemistry and Catalysis, Springer Science & Business Media, 2007. 3. S. Komiya, Synthesis of Organometallic Compounds: A Practical Guide, John Wiley &Sons Ltd, England, 1997.		

9. Corroboration of the content of the discipline with the expectations of the main representatives of the epistemic community, professional associations and employers in the field afferent to the program

- The content of the discipline – Coordinative and organometallic chemistry, is in agreement with similar disciplines in the country and abroad as well as with the expectations of professional associations and representative employers in the field.
- The content of the course was prepared taking into account the needs and expectations of employers in the field. These were identified through discussions that took place within the specialization Board, which includes representatives of the economic environment.

10. Evaluation

Type of activity	**10.1** Evaluation criteria [15]	**10.2** Evaluation methods	**10.3** Share of the final grade

[12] At least one title must belong to the discipline team and at least one title should refer to a reference work for discipline, national and international circulation, existing in the UPT library.
[13] Types of application activities are those specified in footnote 5. If the discipline contains several types of applicative activities then they are sequentially in the lines of the table below. The type of activity will be in a distinct line as: "Seminar:", "Laboratory:", "Project:" and / or "Practice/training".
[14] At least one title must belong to the discipline team.
[15] Syllabus must contain the procedure for assessing the discipline, specifying the criteria, methods and forms of assessment, as well as specifying the weightings assigned to them in the final grade. The evaluation criteria shall be formulated separately for each activity foreseen in the curriculum (course, seminar, laboratory, project). They will also refer to the forms of verification (homework, papers, etc.)

10.4 Course	Knowledge of the basic concepts in the field of coordination and organometallic chemistry. The capacity for practical application of the concepts taught in the course.	Written exam, 3 hours, 4 subjects	0.66
10.5 Applied activities	**S:**		
	L: The degree of involvement in the performance of the works, the interpretation of the results and the presentation of the reports. Seriousness, punctuality.	Discussions with students, evaluation of laboratory reports. Final test to verify practical knowledge.	0.34
	P[16]**:**		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified [17])			
• Promotion conditions: correct performance of all laboratory work, completion of the laboratory activity with a minimum grade of 5, acquisition of the fundamental notions of coordination and organometallic chemistry. The minimum amount of knowledge required is reached if the students have obtained at least grade 5 in each of the subjects received in the exam.			

Date of completion	**Course coordinator (signature)** Associate Professor Eng. Raluca Vodă	**Coordinator of applied activities (signature)** Associate Professor Eng. Raluca Vodă
Head of Department (signature) Conf.dr.ing. Andrea KELLENBERGER	**Date of approval in the Faculty Council** [18]	**Dean (signature)** Ș.L.dr.ing. Mircea Laurențiu DAN

[16] In the case where the project is not a distinct discipline, this section also specifies how the outcome of the project evaluation makes the admission of the student conditional on the final assessment within the discipline.
[17] It will not explain how the promotion mark is awarded.
[18] The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.