




## DISCIPLINE SHEET

### 1.-Info about the program

FOUNDATION FOR DEVELOPMENT AND MANAGEMENT		
1.2-Faculty	FACULTY OF MEDICINE	
1.3-Department	Clinical/ <b>Specialization</b> Discipline	
1.4-Study domain	Health	
1.5-Study cycle	Bachelor	
1.6-Study program/ Calification	Medicine-English	



### 2.-Info about discipline

2.1- Name of the discipline		<b>TOXICOLOGY</b>						
2.2-Course lecturer		Prof. Dr. <b>SCRIPCARU Călin</b> ,MD,PhD						
2.3-Seminary lecturer		Prof. Dr. <b>SCRIPCARU Călin</b> ,MD,PhD						
2.4-Year of study	<b>II</b>	2.5 Semester	<b>II</b>	2.6 Evaluation type	<b>Exam</b>	2.7. Discipline regime	Content	<b>DS</b>
							Mandatory	<b>DOP</b>

### 3. -Total time (hours of didactic activity per semester)

3.1-Number of hours per week	4	3.2 -course	2	3.3- laboratory	2
3.4-Total hours of the curriculum	56	3.5 -course	28	3.6 -laboratory	28
Distribution of time					Hours
Study after manual, course support, bibliography and notes					<b>2</b>
Additional documentatin in the library, on the specialized electronic platforms and on the field					<b>1</b>
Training seminars/laboratories/projects, themes, papers,portofolios and essays					-
Tutoring					-
Examination					<b>1</b>
Other activities					-
3.7 Individual study hours	<b>4</b>				
3.8 Total hours per semester	<b>60</b>				
<sup>3.9</sup> Credit number <sup>5)</sup>	<b>2</b>				

### 4.-Preconditions (if applicable)

4.1 -Curriculum	Not the case
4.2.- Learning Outcomes	Not the case

### 5. -Conditions (where applicable)

5.1. -Course Conduct	Classroom equipped with laptop and video projector.
5.2.-conducting the seminar/laboratory	Seminar room equipped with laptop and video projector.

### 6. Learning outcomes



<b>Knowledge</b>	Acquisition of theoretical knowledge of toxicology – etiology of poisoning, toxicokinetics, toxicodynamics, symptomatology, treatment of poisoning and prevention of poisoning – applied to non-volatile organic toxicants – drugs, zootoxins, toxins produced by macro- and micromycetes, phytopharmaceutical substances. Acquisition of knowledge regarding drug addictions with high incidence, and substances used in doping.
<b>Skills</b>	Detecting cases of poisoning or hypersensitivity, and suggesting emergency treatment. Recognizing contraindications to drug administration;
<b>Responsibilities and autonomy</b>	Activity of prevention of cases of poisoning with medicines, phytopharmaceutical substances. Pharmacovigilance activity. Performing analyses in toxicology laboratories (isolation of medicines and phytopharmaceutical substances from biological samples or crime scenes, identification, dosage, determination of biotoxicological indicators)

#### 7. -Objectives of the discipline (resulting from the grid of specific skills accumulated)

7.1 -General objective of the discipline	Acquiring some fundamental notions regarding the toxicology of organic compounds, the complex problem related to the elucidation of the mechanisms of toxic action, the factors that determine/imprint the toxicity of an organic compound, the methods of evaluating the toxicity of organic substances. , toxic activation pathways occurring in the organic biotransformation process of xenobiotics, symptomatology in the case of acute/chronic poisoning, treatment of acute/chronic poisoning; toxicity profile of organic compounds.
7.2 -Specific objectives	Objectives of the toxicology course: - Implementation of the basic theoretical notions regarding the toxicology of organic compounds; - Acquiring the notions regarding the descriptive toxicology of organic compounds, based on a dual correlation between the structural formula/class of compounds to which the substance belongs and its toxic action; - Preparing future graduates to be competent in diagnosing possible poisonings and directing patients to specialized units in this field. Objectives of practical toxicology work: - Acquiring theoretical and practical notions regarding the basic principles and techniques used in toxicological expertise; - Capitalizing on the knowledge of general chemistry, organic chemistry, biochemistry and analytical chemistry necessary to carry out the toxicological expertise of fissure or volatile organic compounds. - Correct use and handling of biological material and biological samples, basic instruments and equipment in toxicology;



	- Acquisition of modern techniques of toxicological analysis and evaluation of the action of xenobiotics at the biological level: spectrophotometry, spectrofluorimetry, capillary electrophoresis, thin layer chromatography, HPLC, atomic absorption spectrometry, GC-MS, LC-MS.
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8. -Contents

8. 1 Course	Teaching methods	hours/ week	Observati ons
1. TOXICOLOGY OF ORGANIC SUBSTANCES General introduction The main groups of toxic or potentially toxic organic substances. Turpentine	lecture	2	Oral lecture with structured, interactive Power Point presentations, accompanied by a rich and suggestive iconography. The taught material is reviewed and supplemented with the latest information relevant to the specialisation. Each course presents the educational objectives at the beginning and ends with a summar
2. Aromatic hydrocarbons: benzene, toluene, ethylbenzene, styrene, xylene, mesitilene, naphthalene, carcinogenic polynuclear aromatic hydrocarbons		2	
3. Halogenated derivatives: chlorinated derivatives of methane, ethane and ethene; brominated derivatives		2	
4. Hydroxyl compounds: alcohols (methanol, ethanol, ethylene glycol), phenols (phenol, diphenols, pyrogallol, cresol, creosote, naphthols)		2	
5. Carbonyl compounds: aldehydes (methanel, ethanol, paraacetaldehyde, methacetaldehyde, chlorine); triorthocresyl ketones (acetone); Nitro- organic esters and amino derivatives		2	
6. Organic acids: formic acid, acetic acid, oxalic acid, picric acid, salicylic acid Ethers: ethyl ether Esters: inorganic esters (amyl nitrite, nitroglycerin, dimethyl sulfate, phosphate		2	
7. Nitro aliphatic derivatives and aliphatic amino derivatives Nitrosamines Nitro aromatic derivatives: nitrobenzene, trinitrotoluene Amino aromatic derivatives: aniline, naphthylamines, other carcinogenic aromatic amines (2-aminofluorene, trinitrotoluene) Organic acids with anti-inflammatory action. Derivatives of salicylic acid (aspirin, salicylamide, methyl salicylate).		2	
8. Derivatives of anthranilic acid – fenamates (mefenamic acid, meclofenamic acid,		2	



<p>flufenamic acid). Derivatives of propionic acid (ibuprofen, fenoprofen, Derivatives of aryl-acetic and heteroaryl-acetic acids (diclofenac, indomethacin, sulindac)</p>			<p>y of the notions presented.</p>
<p>9. Pyrazolone derivatives (pyrazolidinedione) oxcams Organic acids with antiepileptic action: Valproic acid and Hypnotic derivatives with structure and barbiturate and barbiturate. thiobarbiturate derivatives); other urea derivatives (bromoval);</p>		2	
<p>10. Non-barbiturate hypnotics: zolpidem, zopiclone Hydrazide-structured drugs Hydrazide-structured antituberculosis: isoniazid (HIN) Hydrazide-structured MAOs antidepressants Aniline-derived drugs</p>		2	
<p>11. P-aminophenol derivatives (phenacetin, paracetamol) P-aminobenzoic acid (PABA) and acetanilide derivatives (local anesthetics - procaine, lidocaine; antiarrhythmics - procainamide) Amphetamines (amphetamines and analogues, anorexic drugs amphetamines) Amphetamine derivatives) Anticonvulsants I (drugs) with pyrimidine nucleus (primidone) Drugs with imidazolidine and oxazolidin nucleus (phenytoin, trimethadione) New anticonvulsants Antipsychotic drugs. Basic phenothiazine antipsychotics. Antipsychotics derived from thioxanthene Butyrophenone (haloperidol) Drugs with structure benzodiazepine and triazolobenzodiazepine Antidepressant drugs Tricyclic and tetracyclic antidepressants SSRI antidepressants Histamine. H1 blocking agents Synthetic antimalarial drugs (primaquine, plasmocide, chloroquine, hydroxychloroquine, proguanilpyrimethamine, mepacrine) Sulfonamide drugs (sulfonamides with bacteriostatic, diuretic, antidiabetic action) Antibiotics and antimicrobial and antimycobacterial chemotherapy. Antitumor chemotherapy drugs</p>		2	



<p>12. Toxicology of natural organic compounds and their semi-synthetic and synthetic cardiotoxic heterosides (digitalis, strophanth, scilarene, from leandor) ALKALOIDS Alkaloids with piperidine and pyridinic nucleus (lobelin, conin, nicotine) Alkaloids with a tropan nucleolus and tropan tropan derivatives (atropine, hyoscyamine Alkaloids with imidazole nucleus (pilocarpine) Alkaloids with indole nucleus: stricnic type (strychnine, brucin); phystigmine type (ezerin); ergoline type (alkaloids of ergot) Opium and opium alkaloids with opium alkaloids morphine nucleus (morphine, codeine, thebaine, semi-synthetic and synthetic derivatives (heroin, pethidine, methadone, pentazocine, nalorfin, naloxone, fentanyl, dextromethorphan, tramadol)</p>		22	
<p>13. Opium alkaloids with an isoquinoline nucleus (papaverine, noscapine, narcein) Alkaloids with a nucleus of quinoline and kynudine (derivatives of ribon) (quinine, quinidine) Alkaloids with a tropolonic nucleus (colchicine) Alkaloids terpenoid - alkalonic bases (acaloconidins) Compounds with a xanthine nucleus (purine derivatives) Toxicology of hallucinogenic substances Hallucinogenic hallucinogens: definition, classification, effects, potential for addiction Hallucinogenic substances of plant origin with nitrogen in the molecule: mescaline, psilocybin and psilocin, bufotenin, harmine and hamaline, hallucinogen, er. substances of plant origin without nitrogen in the molecule: THC, cannabinoids Synthetic hallucinogenic substances (LSD)</p>		2	
<p>14. Toxicology of pesticides Organochlorine insecticides Organophosphate insecticides Carbamic insecticide</p>		2	
<p>Mandatory bibliography:          1. Dan Blălașu, Daniela Baconi – Toxicology of natural and related organic substances, Tehnoplast</p>			



<p>Company Publishing House Bucharest, 2001 (ISBN 973 – 98254 – 2 – 7)</p> <p>2. Dan Bălălău, Daniela Baconi – Toxicology of synthetic medicinal substances, Tehnoplast Company Publishing House Bucharest, 2005 (ISBN 973 – 87567 – 3 – 1)</p> <p>3. Daniela Baconi, Dan Bălălău, Pavel Abraham – Abuse and drug addiction. Mechanisms. Demonstrations. Treatment. Legislation, Medical Publishing House, Bucharest, 2008, (ISBN 978 – 973 – 39 – 0661 – 2)</p> <p>4. Daniela Baconi, Dan Bălălău – Organic pollutants. Toxicological data sheets, Tehnoplast Company Publishing House Bucharest, 2013</p> <p>Optional bibliography</p> <p>1. Daniela Baconi, Cristian Bălălău – Toxicology of substances of abuse, Carol Davila University Ed., Bucharest, 2013 (ISBN 978-973-708-686-0)</p> <p>2. Negrei C, Baconi D, Stan M, Synthetic drugs-Toxicological guide - authors: Printech Publishing House, Bucharest, 2015 (ISBN 978-606-23-0430-0)</p> <p>3. Nicoleta Carmen Purdel, Florica Nicolescu – Volatile organic toxicants - course notes, Ed. Printech, Bucharest, 2014 (ISBN 978-606-23-0347-1)</p>			
8.2. -Seminar /Laboratory	Teaching methods	hours/ week	Obs
1.-Toxicology of Organic Substances. Presentation of the main groups of toxic organic substances, with clinical examples and case studies. Case analysis of turpentine poisoning	Oral lecture with structured, interactive PowerPoint	2	
2.-Aromatic Hydrocarbons.Discussion of the toxic effects of benzene, toluene, and other aromatic hydrocarbons. Case study on occupational exposure to aromatic hydrocarbons		2	
3.-Halogenated Derivatives.Toxicity of chlorinated and brominated compounds. Simulation of an intervention protocol for methylene chloride poisoning		2	
4.-Hydroxyl Compounds.Metabolism and toxic effects of alcohols and phenols. Risk assessment in methanol and ethylene glycol poisonings		2	
5.-Carbonyl Compounds.Toxicology of aldehydes and ketones. Interpretation of laboratory results in acetone intoxication		2	
6.-Organic Acids and Esters.Effects of formic and acetic acids on the human body. Management of intoxication with nitroglycerin and dimethyl sulfate		2	
7. -Nitro and Amino Derivatives.Toxicology of nitrosamines and aromatic derivatives. Case study on exposure to trinitrotoluene (TNT)		2	
8.-Nonsteroidal Anti-Inflammatory Drugs (NSAIDs).Mechanisms of action and toxicity of NSAIDs.Risk evaluation in long-term ibuprofen use		2	



9.-Drugs with Hydrazide Structure.Toxicity of isoniazid and other hydrazide-structured medications.Management of adverse reactions in tuberculosis treatment	2
10.-Hypnotics and Sedatives.Classification and toxic effects of barbiturate and non-barbiturate hypnotics..Simulation of an intervention protocol for zolpidem overdose	2
11.-Antidepressants and Antipsychotics.Mechanism of action and toxicity of tricyclic antidepressants.Risk assessment in phenothiazine intoxications	2
12.-Benzodiazepine and Triazolobenzodiazepine Drugs.Toxicology of benzodiazepines and triazolobenzodiazepines..Management of diazepam and alprazolam poisoning	2
13.-Antimalarial and Antituberculosis Drugs Toxicity of chloroquine and other antimalarial drugs.Case study on adverse reactions in antimalarial therapy	2
14.-Pesticides and Insecticides.Mechanisms of action and toxicity of organophosphate pesticides.Simulation of a management protocol in organophosphate poisoning.	2

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- 2.-Negrei C, Baconi D, Stan M, Synthetic drugs-Toxicological guide - authors: Printech Publishing House, Bucharest, 2015 (ISBN 978-606-23-0430-0)
- 3.-Nicoleta Carmen Purdel, Florica Nicolescu – Volatile organic toxicants - course notes, Ed. Printech, Bucharest, 2014 (ISBN 978-606-23-0347-1)

9.- Corroborating/validating the contents of the discipline with the expectations of the representatives of the epistemic community, professional associations and employers representative of the field related to the program



The contents of the discipline are in accordance with the RNCIS standards.

10.- Evaluation

Activity Type		Activity Type	
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10.4 -Course and 10.5-Seminar /Laboratory	Exam – test grid with 50 questions;  ▪Knowledge for the 5th grade: Correct answer to 50% of the questions  ▪Knowledge for grade 10: Correct answer to 100% of the questions	Final evaluation: Grid test with 50 questions 100%;	90%
		Interactivity during the teaching process	10%
10.6 Minimum Performance Standard			
Knowledge of the fundamentals of toxicology.			

Date: 20.04.2025	Discipline coordinator signature: Prof. Dr. <b>SCRIPCARU Călin</b> ,MD,PhD 	Holder of seminar activities: Prof. Dr. <b>SCRIPCARU Călin</b> ,MD,PhD 
Department approval date		
Discipline coordinator signature		

**Reprezentant legal F.D.M.**  
Presedinte  
Prof. Univ. Dr. **POSTĂVARU Nicolae**

