FACULTY OF LIFE SCIENCES

SYLLABUS

FOR

Interdisciplinary Course in Pharmaceutical Sciences (PG)

Examinations: 2019-20

GURU NANAK DEV UNIVERSITY
AMRITSAR

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COURSE SCHEME

<table>
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<tr>
<th>Sr. No.</th>
<th>Course Code</th>
<th>Subject双创</th>
<th>Lecture (L)</th>
<th>Tutorial (T)</th>
<th>Practical (P)</th>
<th>Credit</th>
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<tr>
<td>1.</td>
<td>PHL-051</td>
<td>Drug Design and Drug Development</td>
<td>3</td>
<td>1</td>
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<td>2.</td>
<td>PHL052</td>
<td>Pharmacokinetics &amp; Biopharmaceutics</td>
<td>3</td>
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<td>3.</td>
<td>PHL053</td>
<td>Basic and Fundamental Pharmacology</td>
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<td>4.</td>
<td>PHL054</td>
<td>Basics of Herbal Drug Development</td>
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Interdisciplinary Course in Pharmaceuticals Sciences (PG)

Odd Semester
PHL-051 Drug Design and Drug Development

4 Credits (3-1-0)
Max. Marks : 100
Mid Semester Marks : 20
End Semester Marks : 80

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section A

Section B
Introduction to dosage forms, classification, selection of route of administration. Preparation, evaluation and quality control tests for tablets, Hard& Soft gelatin capsules and parenteral dosage forms. Method and design for bioavailability study.

Section C
Natural sources of drugs: Plants, animals, microbes, mineral, marine and plant tissue cultures as sources of biomedicinals.

An introduction to active constituents of natural drugs: Their classification, properties, general methods of extraction and isolation.

Natural Products as leads for new pharmaceuticals.

Section D
Principles of Experimental Pharmacology: Basic principles of pharmacological evaluation of new chemical entity, animal models in pharmacological research, some standard techniques used in laboratory animals, euthanasia of experimental animals.Regulations for ethical treatment to laboratory animals. Alternatives to animals. Preclinical, safety and clinical evaluation of new drug.
Reading Material Recommended:

7. Pharmacopoeia of India, Govt. of India, Ministry of health and family welfare, Delhi, 1996.
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Even Semester

PHL052-Pharmacokinetics & Biopharmaceutics

4 Credits (3-1-0)

Time: 3 Hrs.

Max. Marks : 100
Mid Semester Marks : 20
End Semester Marks : 80

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section A

Introduction to Pharmacokinetics and Biopharmaceutics, various terms used, Absorption, distribution, metabolism and excretion of drugs. Biological half life, Apparent volume of distribution
Fluid compartments, circulatory system and protein binding.
Compartment models

Section B

One Compartment Open Model: Pharmacokinetics of single dose administration as applied to intravenous (rapid) and oral administration, Intravenous transfusion, Multiple intravenous and oral administration.

Two Compartment Open Model: Pharmacokinetics of single and multiple dose administration, Intravenous transfusion.

Curve fitting- area under blood level curves
Urinary excretion studies, Sigma minus plot

Section C

Pharmacokinetic basis of sustained release formulations
Clinical Pharmacokinetics

Hepatic elimination of drugs, Drug metabolism and its kinetics using one compartment and two compartment models. Liver extraction ratio and its relationship with absolute availability, Relationship between blood flow, Intrinsic clearance and hepatic clearance.
Dosing of drugs in infants, elderly and obese patients.
Dosage regimen adjustment in patients with and without renal failure. Dosage adjustments in uremic patients.
Section D
Bioavailability and Bioequivalence: Definitions, Terminology, Clinical significance and factors affecting biological performance of drugs. Methods of determination of bioavailability using blood level and urinary excretion data, Parameters used to evaluate bioequivalence.

BOOKS RECOMMENDED:
Interdisciplinary Course in Pharmaceuticals Sciences (PG)

Even Semester

PHL 053- Basic and Fundamental Pharmacology

Time: 3 Hrs.

4 Credits (3-1-0)

Max. Marks: 100
Mid Semester Marks: 20
End Semester Marks: 80

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section A

I. Definition and scope of Pharmacology

1. General Principles of Pharmacology

Pharmacokinetics: Routes of drug administration, Physicochemical factors in transfer of drugs across membranes, Absorption, Distribution, Metabolism of drugs, Excretion of drugs
Pharmacodynamics: Mechanisms of drug action and relationship between drug concentration and effect, Types of receptor

Section B

2. Clinical Pharmacology

Pharmaceutical, pharmacokinetic and pharmacodynamic factors affecting drug response
Patient Compliance
Drug therapy in pediatric, geriatric and pregnant patients
Pharmacogenology: Preclinical studies, phase I, phase II, phase III and phase IV clinical trials

Section C

3. Basics of preclinical pharmacology

CPSCEA guidelines, Commonly used species in experimental animals, Basic principles of bioassays

Section D

4. Drug interactions, Adverse Drug Reactions: Dose-related and non-dose related ADRs
Toxicology: Heavy metals and heavy metal antagonists, Non-metallic environmental toxicants, Clinical management of drug poisoning
Books recommended:

1. J.G.Hardman and L.E.Limbird (Eds.), Goodman and Gilman’s The Pharmacological
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Even Semester

PHL054- Basics of Herbal Drug Development

Time: 3 Hrs.

4 Credits (3-1-0)
Max. Marks : 100
Mid Semester Marks : 20
End Semester Marks : 80

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section A
Natural Products as Drugs: Historical background, present status and future scope of natural products in drug discovery.
Recent developments in natural products.

Section B
Scope of plant drug cultivation. Problems of cultivation and processing of medicinal and aromatic plants

Plant tissue culture, types of cultures, nutritional requirements, growth and their maintenance. Applications of plant tissue culture in developing therapeutic agents.

Section C
An introduction to active constituents of drugs: Their extraction, classification and identification tests.

General methods of extraction of plant drugs

Section D
Quality control of crude drugs: Adulteration of crude drugs and their detection by organoleptic, microscopic, physical, chemical and biological methods of evaluation.

Herbs as cosmetics and nutraceuticals
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Recommended Reading Material (Latest editions unless specified):


Suggested Books:
