

Course Units Offered by the Department

Bachelor of Pharmacy Honours

1000 LEVEL – SEMESTER I

| Course code | Course Title | No. of Credits | Prerequisites |
|-------------|--|----------------|---------------|
| EL 1101 | Basic English for Allied Health Sciences 1 | 3* | None |
| AH 1101 | Information Technology | 2* | None |
| AH 1102 | Human Physiology 1 | 3 | None |
| AH 1103 | Basic Human Anatomy | 3 | None |
| AH 1105 | Basic Biochemistry | 3 | None |
| PM 1101 | Social Pharmacy | 1 | None |
| PM 1102 | Physical Pharmacy 1 | 3 | None |
| PM 1103 | Pharmaceutical Mathematics | 2 | None |

1000 LEVEL – SEMESTER II

| Course Code | Course Title | No. of Credits | Prerequisites |
|-------------|--|----------------|---------------|
| EL 1202 | Basic English for Allied Health Sciences 2 | 3* | None |
| AH 1201 | General Pathology | 3 | None |
| AH 1202 | Human Physiology 2 | 3 | None |
| AH 1203 | Basic Statistics | 2 | None |
| PM 1201 | Organic Chemistry | 3 | None |
| PM 1202 | Physical Pharmacy 2 | 3 | None |
| PM 1203 | General Microbiology | 2 | None |
| PM 1204 | Therapeutic Principles | 2 | None |

2000 LEVEL – SEMESTER I

| Course Code | Course Title | No. of Credits | Prerequisites |
|-------------|---|----------------|---------------|
| EL 2103 | Intermediate English for Allied Health Sciences 1 | 3* | None |
| PM 2101 | Pharmaceutical Analysis 1 | 3 | None |
| PM 2102 | Pharmaceutical Dosage Forms 1 | 3 | None |
| PM 2103 | Pharmaceutical Microbiology | 3 | PM1203 |

| | | | |
|---------|-----------------------------------|----|--------|
| PM 2104 | Pharmacology 1 | 3 | PM1204 |
| PM 2105 | Community Pharmacy Practice | 3 | None |
| PM 2106 | Introduction to Health Humanities | 1* | None |

2000 LEVEL – SEMESTER II

| Course Code | Course Title | No. of Credits | Prerequisites |
|--------------------|---|-----------------------|----------------------|
| EL 2204 | Intermediate English for Allied Health Sciences 2 | 3* | None |
| PM 2201 | Pharmaceutical Analysis 2 | 3 | PM 2101 |
| PM 2202 | Pharmaceutical Dosage Forms 2 | 3 | None |
| PM 2203 | Pharmacognosy 1 | 3 | None |
| PM 2204 | Pharmacology 2 | 3 | PM 1204, PM 2104 |
| PM 2205 | Hospital Pharmacy 1 | 2 | None |
| PM 2206 | Pharmacy Law and Ethics 1 | 2 | None |

3000 LEVEL – SEMESTER I

| Course Code | Course Title | No. of Credits | Prerequisites |
|--------------------|-------------------------------|-----------------------|----------------------|
| PM 3101 | Pharmaceutical Technology 1 | 3 | PM 1102 |
| PM 3102 | Pharmaceutical Dosage Forms 3 | 4 | None |
| PM 3103 | Pharmacognosy 2 | 3 | None |
| PM 3104 | Pharmacology 3 | 3 | PM 2204 |
| PM 3105 | Hospital Pharmacy 2 | 2 | None |
| PM 3106 | Pharmacy Law and Ethics 2 | 2 | None |

3000 LEVEL – SEMESTER II

| Course Code | Course Title | No. of Credits | Prerequisites |
|--------------------|--------------------------------|-----------------------|----------------------|
| PM 3201 | Pharmaceutical Technology 2 | 2 | PM 1102 |
| PM 3202 | Novel Therapeutic Dosage Forms | 2 | None |
| PM 3203 | Pharmaceutical Biotechnology | 3 | None |
| PM 3204 | Pharmacology 4 | 3 | PM 2204, PM 3104 |
| PM 3205 | Hospital Pharmacy Practice | 4 | PM 2205, PM3105 |
| PM 3206 | Pharmaceutical Management | 2 | None |

| | | | |
|---------|------------------|-----|------|
| PM 3207 | Research Project | 8 † | None |
|---------|------------------|-----|------|

4000 LEVEL – SEMESTER I

| Course Code | Course Title | No. of Credits | Prerequisites |
|--------------------|-----------------------|-----------------------|----------------------|
| PM 4101 | Medicinal Chemistry 1 | 3 | PM 1201 |
| PM 4102 | Clinical Pharmacy 1 | 3 | PM 2104, PM 2204 |
| PM 4103 | Pharmacoeconomics | 2 | None |
| PM 4104 | Biostatistics | 1 | AH 1203 |
| PM^ | Optional Course | 2 | None |

4000 LEVEL – SEMESTER II

| Course Code | Course Title | No. of Credits | Prerequisites |
|--------------------|-----------------------|-----------------------|----------------------|
| PM 4201 | Medicinal Chemistry 2 | 3 | PM 1201 |
| PM 4202 | Clinical Pharmacy 2 | 3 | PM 2104, PM 2204 |
| PM 4203 | Bio-pharmaceutics | 3 | PM 1204 |

Optional Courses (Only one course can be selected)

| | | | |
|---------|-------------------------------------|---|---------|
| PM 4106 | Pharmaceutical Marketing Management | 2 | PM 3206 |
| PM 4107 | Drug Development and Regulations | 2 | None |
| PM 4108 | Advanced Pharmacy Practice | 2 | None |

*Non-GPA (Courses not included in GPA calculations)

†Research project (PM 3207) will start in 3000 Level Semester II and will continue throughout the 4000 Level. The evaluation procedure will be concluded, and results will be released at the end of 4000 Level Semester II.

Prerequisite: In order to follow the higher-level courses, the student shall complete the lower level courses. Completion of a prerequisite means to have followed the course and fulfilled the eligibility criteria to sit for the end-semester examination for that course.

Synopses of Course Contents

1000 LEVEL

EL 1101 Basic English for Allied Health Sciences 1

(3 Credits)

The aim of this course is to provide the students with the knowledge of basic grammar and language skills and enable students to read, understand and evaluate basic descriptive texts, and to write accurately at UTEL Band 4 Level of competence in the skill areas of Reading and Writing as they transit into a degree programme which is conducted in the English medium. English for General Purposes (EGP) and Allied Health Science-based English for Specific Purposes (ESP) are introduced in an attempt to improve the knowledge of the undergraduates and the course will provide them with an insight and the required knowledge of English in order to function within the academic milieu of a University.

Key Areas of Focus: Selected reading passages describing people, places, Allied Health Science disciplinary themes, texts with appropriate punctuation exercises, reading comprehension texts, and relevant passages with appropriate and sequenced vocabulary elements. Surveying a textbook, skimming and scanning text and processing information appropriately. Language Development and Writing, Formulating simple descriptions of general and scientific context and developing methods of note-taking, Writing short descriptions of self, immediate environment and current situations, formal and informal letters, email and similar communication. Mechanics of Writing: subject-verb agreement, use of connectives, spelling and punctuation. Introduction to dictionary skills for self-learning purposes, Pronunciation and phonetic symbols, Speech activities related to general and academic contexts.

Course assessment: In-course 40%, End semester 60%

AH 1101 Information Technology

(2 Credits)

Basic concept of computers, Types of computers, Components of a computer, System analysis and design, Data processing, Web page development & languages, System analysis and design, Data processing, Computer networks, E-mail/Internet concepts.

Course assessment: In-course 30%, End semester 70%

Introduction to basic organization of the human body, Integration & regulation of the human body functions organized around the homeostasis, Cell physiology, Nervous system, Cardiovascular system, Respiratory system, Lymphatic and Gastrointestinal systems.

AH 1103 Basic Human Anatomy (3 Credits)

Course assessment: In-course 30%, End semester 70%

Structure, Function and metabolism of carbohydrates, Proteins, Lipids and nucleic acids, Regulation and integration of metabolism, Introductory Medical Biochemistry, Biochemical tests for identification of basic biomolecules, Analysis of enzyme properties.

| | | |
|----------------|------------------------|-------------------|
| PM 1101 | Social Pharmacy | (1 Credit) |
|----------------|------------------------|-------------------|

Course assessment: In-course 40%, End semester 60%

Introduction to physical pharmacy, Solutions: solubilization, ionization, colligative properties, Concentration expressions, Rheology, Concepts of dispersed systems: colloids, fundamentals of coarse dispersions.

PM 1103 Pharmaceutical Mathematics (2 Credits)

Course assessment: In-course 30%, End semester 70%

EL 1202 Basic English for Allied Health Sciences 2

(3 Credits)

The aim of this course is to enable students to understand simple instructions, statements, notices and questions, and to be able to formulate these themselves. This will place them at UTEL Band 4 Level of competence in the skill areas of Listening and Speaking.

Key Areas of Focus: Instructions and directions, announcements, basic questions and answers, sequence markers and conjunctions/connectives, short speeches and dialogues, professional instructions, creative expression, telephone conversations. Sharing personal information appropriately, using and explaining quantitative and qualitative data at a basic level, making short speeches, asking and answering questions, telephone and other conversations for social and information-gathering purposes. Vocabulary development and expansion, Group discussions, Presentations, Impromptu Speaking on general and general health topics, Speech related to formal and informal settings and identifying contextual references.

Course assessment: In-course 40%, End semester 60%

AH 1201 General Pathology

(3 Credits)

Introduction to pathological mechanisms common to all tissue-cell pathology, Processes of cell injury, Cellular adaptations to injury, Inflammation and repair, Circulatory disturbances, Immunopathology, Neoplasia and genetic basis of diseases.

Course assessment: In-course 30%, End semester 70%

AH 1202 Human Physiology II

(3 Credits)

Foundation on information of normal physiological functions of the nervous, endocrine, renal and reproductive systems, which will allow an increased understanding of the integration, regulation and homeostasis of the human body as well as changes seen in pathological states.

Course assessment: In-course 30%, End semester 70%

AH 1203 Basic Statistics

(2 Credits)

Big picture of statistics, Data, Sample and population, Variables, Descriptive statistics, Probability and normal curve, Hypothesis and hypothesis testing, Parametric and non-parametric tests, Correlation and introduction to linear regression.

Course assessment: In-course 30%, End semester 70%

PM 1201 Organic Chemistry (3 Credits)

Structure and properties of organic compounds, Reaction mechanisms, Functional group analysis, IUPAC nomenclature, Stereochemistry.

Course assessment: In-course 40%, End semester 60%

PM 1202 Physical Pharmacy 2 (3 Credits)

Solids & crystallization, Physicochemical processes: precipitation, distillation, complexation & miscellaneous processes, Thermodynamics, Fundamentals of kinetics, Physical interactions of pharmaceutical drugs.

Course assessment: In-course 40%, End semester 60%

PM 1203 General Microbiology (2 Credits)

Introduction to microbiology/taxonomy & classification of microbes, Microbial culturing & identification, Role of microbes in causing disease & spoilage of pharmaceuticals, Principles of sterilization, Aseptic techniques & their applications in pharmacy.

Course assessment: In-course 40%, End semester 60%

PM 1204 Therapeutic Principles (2 Credits)

Introduction to pharmacokinetics principles & processes: absorption, distribution, bio-transformation & excretion, Drug information & pharmacovigilance, Safety of medicines.

Course assessment: In-course 30%, End semester 70%

2000 LEVEL

EL 2103 Intermediate English for Allied Health Sciences 1

(3 Credits)

The second year courses are developed with the aim of introducing students to English for Academic Purposes (EAP). A higher level of competency is expected at this level as students will be introduced to technical and formal writing.

The aim of this course is to ensure that students are successful at UTEL Level 5 in the Reading and Writing examinations. More specifically, the course aims to familiarize students with academic texts of a descriptive and argumentative nature, including visuals such as graphs and tables, as well as to ensure that they can summarize, take notes, skim and scan effectively, and write narrative/descriptive/informative texts of approximately 500 words.

This module caters to the need of English competency for academic and professional purposes.

Students will also be familiarized with IELTS, and complex technical writing. Students are expected to undertake writing assignments of some complexity, identify the authorial voice in texts and to state and defend one's position on issues in an argument.

Key Areas of Focus: Academic and professional texts from the main field and sub-fields of Allied Health Sciences, reading comprehension passages of general and specific interest to undergraduates, reference and citation style guides. Academic and professional text writing, visuals (tables, charts, graphs) and data commentaries (qualitative and quantitative). Language Development and Writing, Cause-effect relationships, Process writing, Comparisons, Formal Letter writing, Direct-Indirect Speech, Vocabulary expansion, Thesis statements, Idioms and proverbs, Phrasal Verbs, Varieties of English, Exposure to different accents of English, Poster presentations, Debates, Group discussions and puzzles. Developing schemata and description, Transitional devices, Report writing, Conditionals, Preparation of a Curriculum Vitae, Application procedure, Reading and understanding Journal Articles, Précis Writing, IELTS Practice tests, How to face an Interview, How to make a presentation, Presentation of a report.

Course assessment: In-course 40%, End semester 60%

PM 2101 Pharmaceutical Analysis 1 (3 Credits)

Quality control & quality assessment of analytical data, Good laboratory practice (GLP), Basic laboratory instruments, Data recording & error analysis, Titrimetric analysis, Gravimetric analysis, Atomic & molecular spectroscopy.

Course assessment: In-course 40%, End semester 60%

PM 2102 Pharmaceutical Dosage Forms 1 (3 Credits)

Introduction to different types of dosage forms, Pharmaceutical pharmacopeias & relevant reference material, Principles of dosage form design, Formulation additives, Basic pharmaceutical calculations, Solutions, Suspensions, Emulsions.

Course assessment: In-course 40%, End semester 60%

PM 2103 Pharmaceutical Microbiology (3 Credits)

Contamination of pharmaceutical preparations: growth & multiplication, consequences, screening & control of contamination, Preservation of pharmaceutical preparations, Microbial standards, Pharmaceutical applications of microbiological techniques.

Course assessment: In-course 40%, End semester 60%\

PM 2104 Pharmacology 1 (3 Credits)

General introduction to pharmacology, Pharmacokinetics, Pharmacodynamics, Autacoids, Drugs affecting gastrointestinal functions, Pharmacology of autonomic nervous system, Respiratory Pharmacology.

Course assessment: In-course 40%, End semester 60%

PM 2105 Community Pharmacy Practice (3 Credits)

Introduction to concepts & ethics, Communication skills, Prescription handling process, Education & counselling & patient compliance, Community pharmacy management, Maintaining records, Herbal & complementary medicines, Health promotion, Good pharmacy practice, Community pharmacy training.

Course assessment: In-course 40%, End semester 60%

PM 2106 Introduction to Health Humanities (1 Credit)

Illness, disability, pain, birth & death in literature, Role of creative arts in healing, Patient interviews to understand illness experiences.

Course assessment: In-course 100%

EL 2204 Intermediate English for Allied Health Sciences 1

(3 Credits)

This module The aim of this course is to ensure that students are successful at UTEL Level 5 in the Listening and Speaking examinations. They will, therefore, be able to listen to and grasp the main idea of a short speech, through an understanding of sequence markers and key vocabulary related to these spoken texts. This includes subject-related English for Academic Purposes (EAP). The aim is also to enable students to make short descriptive speeches about themselves, their surroundings and their basic substantive disciplines.

Key Areas of Focus: Short lectures and note-taking, discussions on subject- specific areas, answering listening comprehension exercises, identification of main ideas of verbal/visual texts and provide evidence. Understanding and following complex instructions within the field of AHS. Making impromptu speeches, conducting small- group discussions, role plays and simulations, and delivering short speeches on given topics.

Course assessment: In-course 40%, End semester 60%

PM 2201 Pharmaceutical Analysis 2

(3 Credits)

Introduction to chromatographic techniques, Thin layer chromatography, High performance liquid chromatography, Gas chromatography, Mass spectrometry & hyphenated techniques, NMR, Electroanalytical methods.

Course assessment: In-course 40%, End semester 60%

PM 2202 Pharmaceutical Dosage Forms 2

(3 Credits)

Powders & granules, Tablet dosage forms, Capsules, Semisolid products, Topical & transdermal drug delivery systems, Ophthalmic, nasal & otic preparations.

Course assessment: In-course 40%, End semester 60%

PM 2203 Pharmacognosy 1

(3 Credits)

Introduction to pharmacognosy, Plant-based natural products, Plant secondary metabolites & biosynthesis, Minerals & application, Natural products of animal origin, Marine pharmacognosy, Extraction & isolation techniques of natural products.

Course assessment: In-course 40%, End semester 60%

(3 Credits)

PM 2205 Hospital Pharmacy 1

(2 Credits)

Course assessment: In-course 40%, End semester 60%

PM 2206 Pharmacy Law and Ethics 1

(2 Credits)

Introduction to pharmaceutical legislation, Selected legislation relevant for the practice of pharmacy, Ethics for pharmacists & ethics in animal research, Associations related to pharmacy, Patients' rights & responsibilities, International organizations in drug regulation, Pharmaceutical/professional negligence, Intellectual property rights. Course assessment: In-course 40%, End semester 60%

3000 LEVEL

PM 3101 Pharmaceutical Technology 1

(3 Credits)

Unit operation processes, Industrial hazards & safety precautions, Concepts of mass & heat transfer, Techniques of drying, mixing, milling, filtration, centrifugation, evaporation, distillation, particle size separation, compression & compaction.

Course assessment: In-course 40%, End semester 60%

PM 3102 Pharmaceutical Dosage Forms 3

(4 Credits)

Parenteral products, Aerosols & sprays, Suppositories & pessaries, Surgical products, Medical prosthetics & organ replacement materials, Blood products, Nutraceuticals, Radiopharmaceuticals, Cosmeceuticals, Packaging of pharmaceutical products.

Course assessment: In-course 40%, End semester 60%

PM 3103 Pharmacognosy 2 (3 Credits)

Plant-based drug discovery, Structure elucidation of natural products, Processing of herbal drugs, Crude drugs & adulterants, Bioassay techniques, Herbal formulations: product development, evaluation, quality control, stability testing & regulatory issues.

Course assessment: In-course 40%, End semester 60%

PM 3104 Pharmacology 3 (3 Credits)

Drugs for infectious diseases & parasites, Disinfectants & antiseptics, Vaccines & biological products, Immunopharmacology, Onco-pharmacology.

Course assessment: In-course 40%, End semester 60%

PM 3105 Hospital Pharmacy 2 (2 Credits)

Drug information centre, Poison control centre, Cytotoxic drugs, Radiopharmaceuticals, Aseptic dispensing, Safe use of medicines, Accident & emergency pharmacy, Hospital manufacturing of bulk & sterile products, Re-packaging, Applications of IT in hospital pharmacy.

Course assessment: In-course 40%, End semester 60%

PM 3106 Pharmacy Law and Ethics 2 (2 Credits)

National Medicines Regulatory Authority (NMRA) Act & regulations, Veterinary Ordinance & regulations pertaining to veterinary products, Ayurveda Act, Review of registration documents.

Course assessment: In-course 40%, End semester 60%

PM 3201 Pharmaceutical Technology 2 (2 Credits)

Pre-formulation studies, Fundamentals of machines/equipment used in pharmaceutical manufacture, Verification & calibration of instruments, Plant design/pilot plant scale-up, Packaging material technology, Production management, Evaluation & regulation.

Course assessment: In-course 40%, End semester 60%

PM 3202 Novel Therapeutic Dosage Forms **(2 Credits)**

Introduction to novel drug delivery, Controlled release drug delivery systems, Drug carriers, Transdermal drug delivery systems, Targeted drug delivery systems, Drug immobilization techniques, Nanoparticles, Biosimilars, Novel biological products/proteomics.

Course assessment: In-course 30%, End semester 70%

PM 3203 Pharmaceutical Biotechnology **(3 Credits)**

Introduction to molecular biology & biotechnology, DNA & recombinant DNA technology, Bio process technology, Enzyme biotechnology, Medical biotechnology, Animal biotechnology, Plant biotechnology, Advances in pharmaceutical biotechnology.

Course assessment: In-course 40%, End semester 60%

PM 3204 Pharmacology 4 **(3 Credits)**

CNS Pharmacology: anaesthetics, analgesics, antiepileptics, anti-Parkinson drugs, psycholeptics, psychoanaleptics, Drug treatment of gout, Drug treatment of anaemia, Sports medicine, Drugs used in ear, eye & skin, Introduction to toxicology, Antidotes.

Course assessment: In-course 40%, End semester 60%

PM 3205 Hospital Pharmacy Practice **(4 Credits)**

Hospital pharmacy training on organization & structure, medical supplies and supplying processes, inpatient pharmacy, outpatient pharmacy, safe use of medicines & pharmaceutical waste disposal, specialized areas in pharmacy practice, applications of IT in hospital pharmacy.

Course assessment: In-course 50%, End semester 50%

PM 3206 Pharmaceutical Management **(2 Credits)**

Introduction to management, Basic functions in pharmaceutical management: planning, organizing, leading, & controlling, Organizational behavior, Human resource management, Managerial ethics, Financial and budgetary control systems, Production management, Pharmaceutical supply chain management, Quality management.

Course assessment: In-course 30%, End semester 70%

PM 3207 Research Project **(8 Credits)**

Ethics in research, Conduct literature search, Write hypotheses/problem statement, Design research project under supervision, Collect, analyse, interpret & summarize data, Scientific report writing & presentation, Citation management & referencing.

Course assessment: In-course 90%, End semester 10%

4000 LEVEL

PM 4101 Medicinal Chemistry 1

(3 Credits)

Drug discovery approaches, Modern drug discovery pipeline, Drug targets, ADMET concerns in drug development, Diversity & molecular space of drugs, Synthesis of pharmaceuticals, Traditional methods of lead optimization (SAR), SAR & synthesis of selected drug classes.

Course assessment: In-course 40%, End semester 60%

PM 4102 Clinical Pharmacy 1

(3 Credits)

Introduction to clinical pharmacy, Patient & laboratory data analysis, Activities of a clinical pharmacist: ward round participation, patient counseling, Presentation of cases, Drug & poison information, Pharmacovigilance, Pharmacotherapeutics & disease management, Clinical pharmacokinetics.

Course assessment: In-course 40%, End semester 60%

PM 4103 Pharmacoeconomics

(2 Credits)

Health care context & introduction, Fundamental concepts: costs & cost analysis, outcomes, perspectives, discounting, Types of pharmacoeconomic analyses, Decision analysis, Patient-reported outcomes (PROs), Evaluation of pharmacy services using pharmacoeconomics.

Course assessment: In-course 40%, End semester 60%

PM 4104 Biostatistics

(1 Credit)

Introduction to R, Understanding basic statistical concepts using a real data set, Data visualization, Statistical analysis using R: parametric and non-parametric hypothesis testing, diagnostic tests, simple linear regression, selection of the best test, Sample size calculations.

Course assessment: In-course 40%, End semester 60%

PM4201 Medicinal Chemistry 2

(3 Credits)

QSAR based lead optimization techniques: Hansch analysis, Craig plots, Topliss trees, Molecular descriptors, Linear & non-linear 2D QSAR, 3D QSAR (COMFA), Protein structures in drug discovery, SAR & synthesis of selected drug classes.

Course assessment: In-course 40%, End semester 60%

PM 4202 Clinical Pharmacy 2**(3 Credits)**

Rational use of drugs, Calculation of loading & maintenance doses of drugs, Safe intravenous therapy & hazards of IV therapy, Clinical toxicology, Vaccines & immunization schedules, Pharmacotherapeutics & disease management, Research design & clinical trials.

Course assessment: In-course 40%, End semester 60%

PM 4203 Bio-pharmaceutics**(3 Credits)**

Pharmacokinetic parameters from plasma & urine data, Clearance concepts, Cumulative urinary drug excretion curve, Bioavailability & bioequivalence, In-vivo bioavailability testing, Application of computer software in designing AUC & calculation of pharmacokinetic parameters.

Course assessment: In-course 30%, End semester 70%

Optional Courses**PM 4106 Pharmaceutical Marketing Management****(2 Credits)**

Concepts in marketing, Situational analysis, Consumer analysis, Product strategy, Pricing strategy, Promotional strategy, Sales management, Business ethics, Corporate social responsibility, Corporate shared value, Customer relationship management.

Course assessment: In-course 30%, End semester 70%

PM 4107 Drug Development and Regulations**(2 Credits)**

Introduction, Successful strategies in drug research & development, Preclinical drug development, Clinical trials, FDA drug review, FDA post-market drug safety monitoring, Drug registration in Sri Lanka.

Course assessment: In-course 40%, End semester 60%

PM 4108 Advanced Pharmacy Practice**(2 Credits)**

Introduction to pharmacoepidemiology, Antimicrobial stewardship, Advanced therapeutics & personalized medicine, Utilization of drug literature, Online pharmaceutical care services & globalization, Development of standard operating procedures (SOPs) for pharmacy practice, Pharmacist's role in general practice.

Course assessment: In-course 50%, End semester 50%