Theoretical Components of the radiopharmacy syllabus

Module I: Pharmacy

- Pharmaceutical Technology
- Implications of Good Manufacturing Practice
- Sterile Manufacture
- Pharmaceutical microbiology
- Parenteral Products
- Formulation and Packaging
- Pharmaceutical Analysis
- Pharmacopoeial monographs
- Quality Assurance and Product Performance
- Quality Control Procedures
- Stability and Shelf Life
- Regulations and Legal Aspects
- Marketing Authorisations
- Responsibilities of Personnel
- Biopharmacy (Pharmacokinetics, membrane transport, biodistribution, metabolism)
- Radiotracer transport, pharmacokinetics, modelling

Module II: Radiopharmaceutical chemistry

- History of radiopharmaceutical chemistry
- Physics of radioactivity
- Properties of carrier-free substances, separation techniques
- Production of radionuclides in nuclear reactor and cyclotron
- Targetry, nuclear chemistry, generators
- Synthesis of labelled compounds
- Chemistry of biomolecules chelator attachment
- Purity and stability of labelled compounds, radionuclidic and radiochemical purity
- Radionuclides in analytics, autoradiography
- The radiotracer principle
- Criteria for radiopharmaceuticals
- Production of radiopharmaceutically relevant radionuclides
- ^{99m}Tc- generator
- ^{99m}Tc-radiopharmaceuticals I, basics
- ^{99m}Tc-radiopharmaceuticals I, kit preparation
- Other radiometals
- Radioiodination
- Cell labelling
- PET - radiopharmaceuticals (^{18}F, ^{11}C, ^{13}N, ^{15}O)
- Animal models, disease models, animal protection regulations , ethical issues

Module III: Radiopharmacology and clinical radiopharmacy

- Radiopharmacology and Clinical Radiopharmacy (in-vitro assays, tissue culture)
- Toxicology
- Specialised aspects of biological radiopharmaceuticals
- Drug interventions and interactions/ adverse reactions
- Aspects of biochemistry and molecular biology
- Research and Development techniques
- Nuclear Medicine - aspects of clinical practice
- Radiation therapy and other imaging modalities.
- Immunology
- Adverse reactions
- Statistics: practical exercize