

# **MODULE HANDBOOK**



**MASTER IN CLINICAL PHARMACY  
FACULTY OF PHARMACY  
UNIVERSITAS GADJAH MADA  
2021**

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## Module 1: Advanced Pharmacy Practice (4 Credits)

<b>Advanced Pharmacy Practice</b>	
Code/Status	: FAFK 211101/Compulsory
Level	: Master
Semester	: 1
Course Coordinator/Lecturer	: Fita Rahmawati Zullies Ikawati Mustofa Purwantiningsih Rina Mutiara Yulia Trisna Syed Azhar Syed Sulaiman
Language	: Indonesian, English
Teaching Method/Duration of Classes per Week for One Semester	: Practice-based Learning, 4 hours per week for 14 weeks for one semester
Workload	: 200 minutes in the classroom, 240 minutes of structured activities, 240 minutes of weekly self-directed learning.
Credits	: 4 Credits
Prerequisites	: None
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to develop pharmaceutical care plans and engage in effective communication.</li><li>2. Students are able to master drug information theory and application, including evidence-based medicine and critical appraisal.</li><li>3. Students are able to master the theory and application of pharmacovigilance.</li><li>4. Students are able to comprehend the principles of therapy for specific populations.</li><li>5. Students are able to comprehend principles and application of clinical pharmacokinetics and Therapeutic Drug Monitoring (TDM).</li><li>6. Students are able to comprehend the concept of aseptic dispensing and mixing of IV drugs.</li><li>7. Students are able to comprehend the concept of parenteral nutrition and design suitable Total Parenteral Nutrition (TPN) formulas to meet patients' daily energy needs.</li></ol>
Description	: Development of pharmaceutical care plans, effective communication, drug information (evidence-based medicine, critical appraisal), principles of therapy for specific populations; pharmacovigilance, principles and application of clinical pharmacokinetics and Therapeutic Drug Monitoring (TDM); principles of aseptic dispensing, IV admixture, and handling cytotoxic agents; Total Parenteral Nutrition (TPN).

Examination Format/Assessment Methods	: Essay and case presentation / A-E grading / 40% case analysis, 10% presentation, 20% midterm exam, 30% final exam.
Learning Media	: Case-based learning, group discussions, presentations.
Literature	: <ol style="list-style-type: none"> <li>1. Shargel L, Wu-Pong S &amp; Yu ABC (2005) <i>Applied Biopharmaceutics and Pharmacokinetics</i>. 5th ed., McGraw-Hill Medical Publishing Division, Boston</li> <li>2. Dasgupta A (2008) <i>Introduction to Therapeutic Drug Monitoring</i>. Dalam Dasgupta A (ed) <i>Handbook of Drug Monitoring Methods - Therapeutics and Drugs of Abuse</i>. Humana Press, Totowa NJ</li> <li>3. Lawrence A, Trissel, 2009, <i>Handbook on injectable drug</i>, 15th edition, American Society of health-system Pharmacist, Bethesda, Maryland</li> <li>4. <i>Competency Framework for Specialist Nutrition Pharmacists</i>, 1<sup>st</sup> ed, British Pharmaceutical Nutrition Group, 2008</li> <li>5. Cohen H (2015) <i>Casebook in Clinical Pharmacokinetics and Drug Dosing</i>, McGraw-Hill Education, Medical Publishing Division, United States of America</li> <li>6. Huang SM &amp; R Temple R (2008) Is This the Drug or Dose for You: Impact and Consideration of Ethnic Factors in Global Drug Development, Regulatory, Review, and Clinical Practice. <i>Clin Pharmacol Ther</i> 84 (3): 287-294.</li> <li>7. PICS Guide to Good Practices for The Preparation of Medicinal Products in Healthcare Establishments, 2008, <a href="http://www.picscheme.org">http://www.picscheme.org</a></li> </ol>

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Date of last amendment: 13 September 2021

**Module 2: Advanced Pharmacotherapy in Central Nervous System, Respiratory, and Gastrointestinal (4 Credits)**

<b>Advanced Pharmacotherapy in Central Nervous System, Respiratory, and Gastrointestinal</b>	
Code/Status	: FAFK211102/Compulsory
Level	: Master
Semester	: 1
Course Coordinator/Lecturer	: Zullies Ikawati Agung Endro Nugroho Hilda Ismail Bambang Hastha P Ismail Setyopranoto Abdul Gofir Widyati
Language	: Indonesian
Teaching Method/Duration of Classes per Week for One Semester	: Practice-based Learning, 4 hours per week for 14 weeks for one semester
Workload	: 200 minutes in the classroom, 240 minutes of structured activities, 240 minutes of self-directed weekly learning
Credits	: 4 Credits
Prerequisites	: None
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"> <li>1. Students are able to apply the concepts of pathophysiology, interpret diagnostic tests, identify drug-related problems, recommend therapy, and monitor treatment for neurological disorders.</li> <li>2. Students are able to apply the concepts of pathophysiology, interpret diagnostic tests, identify drug-related problems, recommend therapy, and monitor treatment for psychiatric disorders.</li> <li>3. Students are able to apply the concepts of pathophysiology, interpret diagnostic tests, identify drug-related problems, recommend therapy, and monitor treatment for respiratory disorders.</li> <li>4. Students are able to apply the concepts of pathophysiology, interpret diagnostic tests, identify drug-related problems, recommend therapy, and monitor treatment for gastrointestinal disorders.</li> <li>5. Students are able to complete integrated clinical pharmacy cases in collaboration with other healthcare professionals.</li> </ol>
Description	: This course integrates principles of pathophysiology, clinical data interpretation, pharmacological profiles, and mechanisms of drug action, as well as pharmacotherapy, to formulate and implement pharmaceutical care plans and to monitor and evaluate drug interventions for diseases related to the central nervous, respiratory, and gastrointestinal systems.
Examination Format/Assessment Methods	: Essay, presentation/A-E/25% midterm exam, 25% final exam.

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Learning Media : Case-based learning, presentations, group discussions.

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References : **Primary**

1. Dipiro, J.T., et al. 2011, Pharmacotherapy: A Pathophysiologic Approach, 8th Ed, McGraw-Hill, New York.
2. Kementerian Kesehatan Republik Indonesia, 2011, Modul Penggunaan Obat Rasional, Jakarta: Kementerian Kesehatan Republik Indonesia.

**Additional**

1. Alldredge, B.K., et al., 2013, Koda-Kimble & Young's Applied Therapeutics: The Clinical Use of Drugs, 10th Ed, Lippincott Williams & Wilkins, Philadelphia.
2. Brunton, L.L., et al. 2012, Goodman & Gilman's The Pharmacological basic of therapeutic, 12th Ed, McGraw-Hill, New York.
3. Helms, R.A., et al. 2006, Textbook of Therapeutics, Drug and Disease Management, 8th Ed., Lippincot & Williams, Philadelphia.
4. Holloway, K. & van Dijk, L., 2011, The World Medicines Situation 2011: Rational Use of Medicines, Geneva: World Health Organization.
5. Scwinghammer, T.L. & Koehler, J.M., 2009, Pharmacotherapy Casebook: A Patient Focused Approach, 7th Ed., McGraw-Hill, New York.

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Date of last amendment: 13 September 2021

### Module 3: Advanced Pharmacotherapy in System of Cardiovascular, Renal and, Endocrine (4 Credits)

<b>Advanced Pharmacotherapy in System of Cardiovascular, Renal and, Endocrine</b>	
Code/Status	: FAFK211103/Compulsory
Level	: Master
Semester	: 1
Course Coordinator/Lecturer	: Tri Murti Andayani Fita Rahmawati Ida I Dewa Putu Pramantara Probosuseno Budi Rahardjo Halim Priyahau Bambang Sulistyo Ari Sudarmanto
Language	: Indonesian
Teaching Method/Duration of Classes per Week for One Semester	: Practice-based Learning, 4 hours per week for 14 weeks for one semester
Workload	: 200 minutes in the classroom, 240 minutes of structured activities, 240 minutes of weekly self-directed learning.
Credits	: 4 Credits
Prerequisites	: None
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to apply the concepts of pathophysiology to determine appropriate drug administration and assess the therapeutic outcomes in cases of endocrine, renal, and cardiovascular diseases.</li><li>2. Students are able to interpret diagnostic data, including clinical pathology/laboratory results, anatomical pathology examinations, radiology findings, and other imaging results, related to endocrine, renal, and cardiovascular diseases.</li><li>3. Students are able to comprehend pharmacology and the relationship between the structure and activity of drugs used for endocrine, renal, and cardiovascular diseases.</li><li>4. Students are able to identify drug-related problems, recommend therapeutic options, and develop monitoring strategies for the effectiveness and side effects of drug therapies in cases of endocrine, renal, and cardiovascular diseases.</li><li>5. Students are able to evaluate treatment management and implement individualized monitoring strategies for therapy in patients with endocrine, renal, and cardiovascular diseases.</li></ol>
Description	: This course integrates principles of pathophysiology, clinical data interpretation, pharmacological profiles, and mechanisms of drug action, as well as pharmacotherapy to formulate and implement pharmaceutical care plans, and to monitor and evaluate drug interventions for endocrine, renal, and cardiovascular disorders.

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Examination Format/Assessment Methods	: Essay, presentation/A-E/30% midterm exam, 30% final exam.
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Learning Media	: Case-based learning, presentations, group discussions
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References	: <b>Primary</b>
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1. Dipiro, J.T., et al. 2011, Pharmacotherapy: A Pathophysiologic Approach, 8th Ed, McGraw-Hill, New York.
2. Kementerian Kesehatan Republik Indonesia, 2011, Modul Penggunaan Obat Rasional, Jakarta: Kementerian Kesehatan Republik Indonesia.

**Additional**

1. Alldredge, B.K., et al., 2013, Koda-Kimble & Young's Applied Therapeutics: The Clinical Use of Drugs, 10th Ed, Lippincott Williams & Wilkins, Philadelphia.
2. Brunton, L.L., et al. 2012, Goodman & Gilman's The Pharmacological basic of therapeutic, 12th Ed, McGraw-Hill, New York.
3. Helms, R.A., et al. 2006, Textbook of Therapeutics, Drug and Disease Management, 8th Ed., Lippincot & Williams, Philadelphia.
4. Holloway, K. & van Djik, L., 2011, The World Medicines Situation 2011: Rational Use of Medicines, Geneva: World Health Organization.
5. Scwinghammer, T.L. & Koehler, J.M., 2009, Pharmacotherapy Casebook: A Patient Focused Approach, 7th Ed., McGraw-Hill, New York.

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Date of last amendment: 13 September 2021



**Module 4: Advanced Pharmacotherapy in Immunological System, Cancer, and Infectious Diseases (4 Credits)**

<b>Advanced Pharmacotherapy in Immunological System, Cancer, and Infectious Diseases.</b>	
Code/Status	: FAFK211103/Compulsory
Level	: Master
Semester	: 1
Course Coordinator/Lecturer	: Tri Murti Andayani Fita Rahmawati Ida I Dewa Putu Pramantara Probosuseno Budi Rahardjo Halim Priyahau Bambang Sulisty Ari Sudarmanto
Language	: Indonesian
Teaching Method/Duration of Classes per Week for One Semester	: Practice-based Learning, 4 hours per week for 14 weeks for one semester
Workload	: 200 minutes in the classroom, 240 minutes of structured activities, 240 minutes of self-directed weekly learning
Credits	: 4 Credits
Prerequisites	: None
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to apply the concepts of pathophysiology to determine appropriate drug administration and assess the therapeutic outcomes in cases of endocrine, renal, and cardiovascular diseases.</li><li>2. Students are able to interpret diagnostic data, including clinical pathology/laboratory results, anatomical pathology examinations, radiology findings, and other imaging results, related to endocrine, renal, and cardiovascular diseases.</li><li>3. Students are able to comprehend pharmacology and the relationship between the structure and activity of drugs used for endocrine, renal, and cardiovascular diseases.</li><li>4. Students are able to identify drug-related problems, recommend therapeutic options, and develop monitoring strategies for the effectiveness and side effects of drug therapies in cases of endocrine, renal, and cardiovascular diseases.</li><li>5. Students are able to evaluate treatment management and implement individualized monitoring strategies for therapy in patients with endocrine, renal, and cardiovascular diseases.</li></ol>
Description	: This course integrates principles of pathophysiology, clinical data interpretation, pharmacological profiles, and mechanisms of drug action, as well as pharmacotherapy to formulate and implement

	pharmaceutical care plans, and to monitor and evaluate drug interventions for endocrine, renal, and cardiovascular disorders.
Examination Format/Assessment Methods	: Essay, presentation/A-E/30% midterm exam, 30% final exam.
Learning Media	: Case-based learning, presentations, group discussions.
References	: <b>Primary</b> <ol style="list-style-type: none"> <li>1. Dipiro, J.T., et al. 2011, Pharmacotherapy: A Pathophysiologic Approach, 8th Ed, McGraw-Hill, New York.</li> <li>2. Kementerian Kesehatan Republik Indonesia, 2011, Modul Penggunaan Obat Rasional, Jakarta: Kementerian Kesehatan Republik Indonesia.</li> </ol> <p><b>Additional</b></p> <ol style="list-style-type: none"> <li>1. Alldredge, B.K., et al., 2013, Koda-Kimble &amp; Young's Applied Therapeutics: The Clinical Use of Drugs, 10th Ed, Lippincott Williams &amp; Wilkins, Philadelphia.</li> <li>2. Brunton, L.L., et al. 2012, Goodman &amp; Gilman's The Pharmacological basic of therapeutic, 12th Ed, McGraw-Hill, New York.</li> <li>3. Helms, R.A., et al. 2006, Textbook of Therapeutics, Drug and Disease Management, 8th Ed., Lippincot &amp; Williams, Philadelphia.</li> <li>4. Holloway, K. &amp; van Djik, L., 2011, The World Medicines Situation 2011: Rational Use of Medicines, Geneva: World Health Organization.</li> <li>5. Scwinghammer, T.L. &amp; Koehler, J.M., 2009, Pharmacotherapy Casebook: A Patient Focused Approach, 7th Ed., McGraw-Hill, New York.</li> </ol>

Date of last amendment: 13 September 2021

**Module 5: Thesis I (2 Credits)**

<b>Thesis I</b>	
Code/Status	: FAFK 211201/Compulsory
Level	: Master
Semester	: 2
Course Coordinator/Lecturer	: Fita Rahmawati Erna Kristin Dibyo Pramono Rizaldy Taslim Pinzon Zullies Ikawati Tri Murti Andayani Nanang Munif Yasin
Language	: Indonesian, English
Teaching Method/Duration of Classes per Week for One Semester	: Lecture, discussion, question and answer sessions, consultation, thesis proposal writing
Workload	: 225 hours allocated for the writing of a thesis proposal within one semester
Credits	: 2 Credits
Prerequisites	: None
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to write a thesis proposal based on up-to-date literature and in accordance with the guidelines for thesis proposal writing.</li><li>2. Students are able to determine the research's urgency.</li><li>3. Students are able to determine the novelty of the research.</li><li>4. Students are able to develop a research design.</li><li>5. Students are able to deliver effective presentations.</li><li>6. Students are able to respond to questions related to their research effectively.</li></ol>
Description	: This course covers the principles of research, including research ethics and writing, hypothesis formulation, research design, methods for selecting research instruments, determination of research subjects, methods for data collection and sample size determination, data presentation and analysis techniques, as well as how to write research proposals and reports.
Examination Format/Assessment Methods	: Thesis proposal examination, 100%.
Learning Media	: Case-based learning, project-based learning
References	: <b>Primary:</b> <ol style="list-style-type: none"><li>1. Gibaldi, J., 1999, <i>MLA Handbook For Writers Of Research Papers.</i>, 5th Ed., The Modern Language Association Of America New York</li></ol>

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2. Mulyadi, 2001, Skripsi I (Metodologi Penelitian) Bagian Sampel, Data, Analisis Data, dan Penyusunan Laporan Penelitian, Buku Ajar Fakultas Farmasi UGM
  3. Nelson, A.A., 1980, Research Methods For Pharmaceutical Practice, Am., J. Hosp. Pharm., 37,107-110
  4. Pratiknya, A.W., 2003., Dasar-Dasar Metodologi Penelitian Kedokteran Dan Kesehatan, PT. Raja Grafindo Persada, jakarta.
  5. Schefler, W.C., 1979, Statistika Untuk Biologi, Farmasi, Kedokteran, Dan Ilmu Yang Bertautan, Edisi Tejemahan: Suroso, Penerbit ITB, Bandung

**Additional:**

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Date of last amendment: 13 September 2021

**Module 6: Thesis II (8 Credits)**

<b>Thesis II</b>	
Code/Status	: FAFK 211302/Compulsory
Level	: Master
Semester	: 3/4
Course Coordinator/Lecturer	: Fita Rahmawati Zullies Ikawati Tri Murti Andayani Nanang Munif Yasin
Language	: Indonesian, English
Teaching Method/Duration of Classes per Week for One Semester	: Thesis consultation and writing
Workload	: 675 hours allocated for the writing of a thesis within one semester
Credits	: 8 Credits
Prerequisites	: None
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to write a thesis proposal based on up-to-date literature and in accordance with the guidelines for thesis proposal writing.</li><li>2. Students are able to determine the research's urgency</li><li>3. Students are able to determine the novelty of the research.</li><li>4. Students are able to develop a research design and conduct research data analysis.</li><li>5. Students are able to deliver effective presentations.</li><li>6. Students are able to respond to questions related to their research effectively.</li></ol>
Description	: This course covers principles of writing research outcomes starting from obtaining permissions, data collection, data analysis, thesis writing, manuscript publication writing, as well as presenting research results in a seminar.
Examination Format/Assessment Methods	: Open examination 80%, open seminar 20%.
Learning Media	: Case-based learning, project-based learning
References	: <b>Primary:</b> <ol style="list-style-type: none"><li>1. Gibaldi, J., 1999, <i>MLA Handbook For Writers Of Research Papers</i>, 5th Ed., The Modern Language Association Of America New York</li><li>2. Mulyadi, 2001, <i>Skripsi I (Metodologi Penelitian) Bagian Sampel, Data, Analisis Data, dan Penyusunan Laporan Penelitian</i>, Buku Ajar Fakultas Farmasi UGM</li><li>3. Nelson, A.A., 1980, <i>Research Methods For Pharmaceutical Practice</i>, Am., <i>J. Hosp. Pharm.</i>, 37,107-110</li></ol>

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4. Pratiknya, A.W., 2003., Dasar-Dasar Metodologi Penelitian Kedokteran Dan Kesehatan, PT. Raja Grafindo Persada, Jakarta.
  5. Scheffler, W.C., 1979, Statistika Untuk Biologi, Farmasi, Kedokteran, Dan Ilmu Yang Bertautan, Edisi Tejemahan: Suroso, Penerbit ITB, Bandung

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## Module 7: Clinical Internship in Internal Medicine (3 Credits)

Clinical Internship in Internal Medicine.	
Code/Status	: FAFK211202/Compulsory
Level	: Master
Semester	: 1
Course Coordinator/Lecturer	: Fita Rahmawati
Language	: Indonesian
Teaching Method/Duration of Classes per Week for One Semester	: Practice-based Learning, 25 hours per week for 4 weeks for one semester
Workload	: 150 hours of internship for one semester
Credits	: 3 Credits
Prerequisites	: Students must have successfully completed all compulsory courses, elective courses, and clinical pharmacy case study courses. A TOEFL score of 500 is required to ensure English language proficiency for the internship program at international hospitals.
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to conduct medication reconciliation for patients.</li><li>2. Students are able to apply pathophysiology theories and identify Drug-Related Problems (DRPs) in patients.</li><li>3. Students are able to recommend solutions for DRPs and implement appropriate therapy monitoring.</li><li>4. Students are able to conduct medication counseling for patients.</li><li>5. Students are able to demonstrate professional attitudes and express ideas.</li></ol>
Description	: This clinical practice training applies the theory of disease pathophysiology and pharmaceutical care plans to internal medicine cases.
Examination Format/Assessment Methods	: Essay, presentation/A-E/presentation, examination, report 90%, attitude 10%.
Learning Media	: Internship
References	: <b>Primary:</b> <ol style="list-style-type: none"><li>1. Charles, F. and Lacy, 2017. Drugs Information Handbook, 26 Edition, Lexi-comp drug reference handbook, USA.</li><li>2. DiPiro, J.T., Talbert, R.L., Yee, G.C., Matzke, G.R., Wells, B.G., 2017. Pharmacotherapy: A Pathophysiologic Approach, Tenth Edition. Mc Graw Hill. New York</li><li>3. Papadopoulos, J., 2014. Pocket Guide to Critical Care Pharmacotherapy. Springer New York.</li><li>4. Preston, C.L., 2016. Stockley's Drug Interactions: A Source Book of Interactions, Their Mechanisms, Clinical Importance and Management. Pharmaceutical Press.</li></ol>

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5. Zeind, C.S. dan Carvalho, M.G., 2017. Applied Therapeutics. Lippincott Williams & Wilkins.
  6. Drugs.com, medscape, lexicomp

**Additional:**

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Date of last amendment: 13 September 2021



## Module 8: Clinical Internship in Geriatrics (3 Credits)

Clinical Internship in Geriatrics	
Code/Status	: FAFK211301/Elective
Level	: Master
Semester	: 2-3
Course Coordinator/Lecturer	: Fita Rahmawati
Language	: Indonesian
Teaching Method/Duration of Classes per Week for One Semester	: Practice-based Learning, 25 hours per week for 4 weeks for one semester
Workload	: 150 hours of internship for one semester
Credits	: 3 Credits
Prerequisites	: Students must have successfully completed all compulsory courses, elective courses, and clinical pharmacy case study courses. A TOEFL score of 500 is required to ensure English language proficiency for the internship program at international hospitals.
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to conduct medication reconciliation for patients.</li><li>2. Students are able to apply pathophysiology theories and identify Drug-Related Problems (DRPs) in patients.</li><li>3. Students are able to recommend solutions for DRPs and implement appropriate therapy monitoring.</li><li>4. Students are able to conduct medication counseling for patients.</li><li>5. Students are able to demonstrate professional attitudes and express ideas.</li></ol>
Description	: This clinical practice training applies the theory of disease pathophysiology and pharmaceutical care plans to geriatric cases.
Examination Format/Assessment Methods	: Essay, presentation/A-E/presentation, examination, report 90%, attitude 10%.
Learning Media	: Internship
References	: <ol style="list-style-type: none"><li>1. Anonymous, 2015, AGS Beers Criteria For Potentially Inappropriate Medication Use in Older Adults, AGS, USA.</li><li>2. Anonymous, 2016, STOPP START Toolkit Supporting Medication Review, NHS, Scotland</li><li>3. Charles, F. and Lacy, 2017. Drugs Information Handbook, 26 Edition, Lexi-comp drug reference handbook, USA.</li><li>4. DiPiro, J.T., ; Talbert, R.L., Yee, G.C., Matzke, G.R., Wells, B.G., 2017. Pharmacotherapy: A Pathophysiologic Approach, Tenth Edition. Mc Graw Hill. New York</li><li>5. Drugs.com, medscape, lexicomp</li></ol>

Date of last amendment: 13 September 2021

## Module 9: Clinical Internship in Pediatrics (3 Credits)

Clinical Internship in Pediatrics	
Code/Status	: FAFK211215/Elective
Level	: Master
Semester	: 2-3
Course Coordinator/Lecturer	: Fita Rahmawati
Language	: Indonesian
Teaching Method/Duration of Classes per Week for One Semester	: Practice-based Learning, 25 hours per week for 4 weeks for one semester
Workload	: 150 hours of internship for one semester
Credits	: 3 Credits
Prerequisites	: Students must have successfully completed all compulsory courses, elective courses, and clinical pharmacy case study courses. A TOEFL score of 500 is required to ensure English language proficiency for the internship program at international hospitals.
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to conduct medication reconciliation for patients.</li><li>2. Students are able to apply pathophysiology theories and identify Drug-Related Problems (DRPs) in patients.</li><li>3. Students are able to recommend solutions for DRPs and implement appropriate therapy monitoring.</li><li>4. Students are able to conduct medication counseling for patients.</li><li>5. Students are able to demonstrate professional attitudes and express ideas.</li></ol>
Description	: This clinical practice training applies the theory of disease pathophysiology and pharmaceutical care plans to pediatric cases.
Examination Format/Assessment Methods	: Essay, Presentation/A-E/ 90% Presentation, Examination, Reports, 10% Attitude
Learning Media	: Internship
References	: <b>Primary:</b> <ol style="list-style-type: none"><li>1. Benavides, S., Nahata, M.C., Chicella, M., et.al, 2013. Pediatric Pharmacotherapy, American College of Clinical Pharmacy</li><li>2. Taketomo, C.K., 2018. Pediatric &amp; Neonatal Dosage Handbook, 25th Edition. Lexi-comp drug reference handbook, USA.</li><li>3. Charles, F. and Lacy, 2017. Drugs Information Handbook, 26 Edition, Lexi-comp drug reference handbook, USA.</li><li>4. DiPiro, J.T., Talbert, R.L., Yee, G.C., Matzke, G.R., Wells, B.G., 2017. Pharmacotherapy: A Pathophysiologic Approach, Tenth Edition. Mc Graw Hill. New York</li><li>5. Drugs.com, medscape, lexicomp</li></ol> <b>Additional:</b>

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## Module 10: Clinical Internship in Neurology (3 Credits)

Clinical Internship in Neurology	
Code/Status	: FAFK211217/Elective
Level	: Master
Semester	: 1
Course Coordinator/Lecturer	: Fita Rahmawati
Language	: Indonesian
Teaching Method/Duration of Classes per Week for One Semester	: Practice-based Learning, 25 hours per week for 4 weeks for one semester
Workload	: 150 hours of internship for one semester
Credits	: 3 Credits
Prerequisites	: Students must have successfully completed all compulsory courses, elective courses, and clinical pharmacy case study courses. A TOEFL score of 500 is required to ensure English language proficiency for the internship program at international hospitals.
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to conduct medication reconciliation for patients.</li><li>2. Students are able to apply pathophysiology theories and identify Drug-Related Problems (DRPs) in patients.</li><li>3. Students are able to recommend solutions for DRPs and implement appropriate therapy monitoring.</li><li>4. Students are able to conduct medication counseling for patients.</li><li>5. Students are able to demonstrate professional attitudes and express ideas.</li></ol>
Description	: This clinical practice training applies the theory of disease pathophysiology and pharmaceutical care plans to neurology cases.
Examination Format/Assessment Methods	: Essay, presentation/A-E/presentation, examination, report 90%, attitude 10%.
Learning Media	: Internship
References	: <b>Primary:</b> <ol style="list-style-type: none"><li>1. Gofir, A., 2010, Manajemen Stroke, Pustaka Cendekia Press, Yogyakarta</li><li>2. Ikawati, Z., 2018, Penatalaksanaan Terapi Penyakit Sistem Saraf, Bursa Ilmu, Yogyakarta</li><li>3. Charles, F. and Lacy, 2017. Drugs Information Handbook, 26 Edition, Lexi-comp drug reference handbook, USA.</li><li>4. DiPiro, J.T., Talbert, R.L., Yee, G.C., Matzke, G.R., Wells, B.G., 2017. Pharmacotherapy: A Pathophysiologic Approach, Tenth Edition. Mc Graw Hill. New York</li><li>5. Drugs.com, medscape, lexicom</li></ol> <b>Additional:</b>

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Date of last amendment: 13 September 2021

### Module 11: Clinical Internship in Oncology (3 Credits)

Clinical Internship in Oncology	
Code/Status	: FAFK211218/Elective
Level	: Master
Semester	: 2
Course Coordinator/Lecturer	: Fita Rahmawati
Language	: Indonesian
Teaching Method/Duration of Classes per Week for One Semester	: Practice-based Learning, 25 hours per week for 4 weeks for one semester
Workload	: 150 hours of internship for one semester
Number of credit hours	: 3 Credits
Prerequisites	: Students must have successfully completed all compulsory courses, elective courses, and clinical pharmacy case study courses. A TOEFL score of 500 is required to ensure English language proficiency for the internship program at international hospitals.
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to conduct medication reconciliation for patients.</li><li>2. Students are able to apply pathophysiology theories and identify Drug-Related Problems (DRPs) in patients.</li><li>3. Students are able to recommend solutions for DRPs and implement appropriate therapy monitoring.</li><li>4. Students are able to conduct medication counseling for patients.</li><li>5. Students are able to demonstrate professional attitudes and express ideas.</li></ol>
Description	: This clinical practice training involves the application of disease pathophysiology theories and pharmaceutical care plans in oncology cases.
Examination Format/Assessment Methods	: Essay, Presentation/A-E/ 90% Presentation, Examination, Reports, 10% Attitude
Learning Media	: Internship
References	: <b>Primary:</b> <ol style="list-style-type: none"><li>1. DiPiro, J.T., Talbert, R.L., Yee, G.C., Matzke, G.R., Wells, B.G., 2017. Pharmacotherapy: A Pathophysiologic Approach, Tenth Edition. Mc Graw Hill. New York</li><li>2. Charles, F. and Lacy, 2017. Drugs Information Handbook, 26 Edition, Lexi-comp drug reference handbook, USA.</li><li>3. Ettinger, D.S., Berger, M.J., et al. 2017. Antiemesis. National Comprehensive Cancer Network, Inc.</li><li>4. Zeind, C.S. and Carvalho, M.G., 2017. Applied Therapeutics: The Clinical Use of Drugs. Lippincott Williams &amp; Wilkins. USA.</li></ol>

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5. Bragalone, D.L., 2017. Drug Information Handbook for Oncology, 15th Edition. Lexi-comp drug reference handbook, USA.
  6. AHFS, 2018. Handbook on Injectable Drugs: ASHP's Guide to IV Compatibility and Stability American Society of Health-System Pharmacists, Bethesda, United States.
  7. World Health Organization. Blood Transfusion Safety Team. (2001). The Clinical use of blood: handbook. Geneva: World Health Organization. <http://www.who.int/iris/handle/10665/42396>

**Additional:**

1. Clinical Learning Guidelines for Master of Clinical Pharmacy, Universitas Gadjah Mada

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Date of last amendment: 13 September 2021

## Module 12: Clinical Internship in Cardiology (3 Credits)

Clinical Internship in Cardiology	
Code/Status	: FAFK211216/Elective
Level	: Master
Semester	: 1
Course Coordinator/Lecturer	: Fita Rahmawati
Language	: Indonesian
Teaching Method/Duration of Classes per Week for One Semester	: Practice-based Learning, 25 hours per week for 4 weeks for one semester
Workload	: 150 hours of internship for one semester
Credits	: 3 Credits
Prerequisites	: Students must have successfully completed all compulsory courses, elective courses, and clinical pharmacy case study courses. A TOEFL score of 500 is required to ensure English language proficiency for the internship program at international hospitals.
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to conduct medication reconciliation for patients.</li><li>2. Students are able to apply pathophysiology theories and identify Drug-Related Problems (DRPs) in patients.</li><li>3. Students are able to recommend solutions for DRPs and implement appropriate therapy monitoring.</li><li>4. Students are able to conduct medication counseling for patients.</li><li>5. Students are able to demonstrate professional attitudes and express ideas.</li></ol>
Description	: This clinical practice training applies the theory of disease pathophysiology and pharmaceutical care plans to cardiology cases.
Examination Format/Assessment Methods	: Essay, presentation/A-E/presentation, examination, report 90%, attitude 10%.
Learning Media	: Internship
References	: <b>Primary:</b> <ol style="list-style-type: none"><li>1. DiPiro, J.T., ; Talbert, R.L., Yee, G.C., Matzke, G.R., Wells, B.G., 2017. Pharmacotherapy: A Pathophysiologic Approach, Tenth Edition. Mc Graw Hill. New York</li><li>2. Charles, F. and Lacy, 2017. Drugs Information Handbook, 26 Edition, Lexi-comp drug reference handbook, USA.</li><li>3. Frishman, W.H. And Sonnenblick, E.H., 1998. Cardiovascular Pharmacotherapeutics Companion Handbook, The Mcgraw-Hill Companies Inc. New York</li><li>4. Zeind, C.S. and Carvalho, M.G., 2017. Applied Therapeutics: The Clinical Use of Drugs. Lippincott Williams &amp; Wilkins. USA.</li><li>5. Drugs.com, medscape, lexicomp</li></ol>



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**Additional:**

1. Clinical Learning Guidelines for Master of Clinical Pharmacy,  
Universitas Gadjah Mada

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Date of last amendment: 13 September 2021

### Module 13: Clinical Internship in ICU (3 Credits)

Clinical Internship in ICU	
Code/Status	: FAFK211220/Elective
Level	: Master
Semester	: 2-3
Course Coordinator/Lecturer	: Fita Rahmawati
Language	: Indonesian
Teaching Method/Duration of Classes per Week for One Semester	: Practice-based Learning, 25 hours per week for 4 weeks for one semester
Workload	: 150 hours of internship for one semester
Credits	: 3 Credits
Prerequisites	: Students must have successfully completed all compulsory courses, elective courses, and clinical pharmacy case study courses. A TOEFL score of 500 is required to ensure English language proficiency for the internship program at international hospitals.
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to conduct medication reconciliation for patients.</li><li>2. Students are able to apply pathophysiology theories and identify Drug-Related Problems (DRPs) in patients.</li><li>3. Students are able to recommend solutions for DRPs and implement appropriate therapy monitoring.</li><li>4. Students are able to conduct medication counseling for patients.</li><li>5. Students are able to demonstrate professional attitudes and express ideas.</li></ol>
Description	: This clinical practice training applies the theory of disease pathophysiology and pharmaceutical care plans in the Intensive Care Unit (ICU).
Examination Format/Assessment Methods	: Essay, presentation/A-E/presentation, examination, report 90%, attitude 10%.
Learning Media	: Internship
References	: <ol style="list-style-type: none"><li>1. Brown, J., Illingworth, W., and Munro, C., 2008. Oxford American Handbook of Emergency Medicine, Oxford University Press</li><li>2. Deutschman, C.S., and Neligan, P.J., 2010, Evidence-based Practice of Critical Care, Elsevier Health Sciences.</li><li>3. Papadopoulos, J., 2014. Pocket Guide to Critical Care Pharmacotherapy. Springer New York.</li><li>4. Ministry of Health, 2013, Critical Care Pharmacy Handbook, Perpustakaan Negara Malaysia.</li><li>5. Charles, F. and Lacy, 2017. Drugs Information Handbook, 26 Edition, Lexi-comp drug reference handbook, USA.</li></ol>

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6. DiPiro, J.T., Talbert, R.L., Yee, G.C., Matzke, G.R., Wells, B.G., 2017. Pharmacotherapy: A Pathophysiologic Approach, Tenth Edition. Mc Graw Hill. New York
  7. Drugs.com, medscape, lexicom
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Date of last amendment: 13 September 2021

## Module 14: Clinical Internship in Drug Information Services (3 Credits)

<b>Clinical Internship in Drug Information Services</b>	
Code/Status	: FAFK211221/Elective
Level	: Master
Semester	: 2 and 3
Course Coordinator/Lecturer	: Fita Rahmawati
Language	: Indonesian, English
Teaching Method/Duration of Classes per Week for One Semester	: Practice-based Learning, 25 hours per week for 4 weeks for one semester
Workload	: 150 hours of internship for one semester
Credits	: 3 Credits
Prerequisites	: Students must have successfully completed all compulsory courses, elective courses, and clinical pharmacy case study courses. A TOEFL score of 500 is required to ensure English language proficiency for the internship program at international hospitals.
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to develop competence in the use of drug information systems.</li><li>2. Students are able to apply primary literature in responding to drug information requests.</li><li>3. Students are able to engage in effective oral and written communication.</li><li>4. Students are able to demonstrate a responsible and confident attitude in providing drug information.</li></ol>
Description	: The clinical practice training provides experience and comprehension of the scope of Drug Information Services, including the use of drug information systems, applying evidence-based medicine in responding to drug information requests, and effective oral and written communication skills.
Examination Format/Assessment Methods	: Case Report/ A-E/ 100% Presentation, Examination, and Report
Learning Media	: Case-based learning, internship
References	: <ol style="list-style-type: none"><li>1. Acton, Q.A., 2012. Issues in Pharmacology, Pharmacy, Drug Research, and Drug Innovation: 2011 Edition. ScholarlyEditions.</li><li>2. Parthasarathi, G., Nyfort-Hansen, K., dan Nahata, M.C., 2004. A Text Book of Clinical Pharmacy Practice: Essential Concepts and Skills. Orient Longman Limited.</li><li>3. Rantucci, M.J., 2007. Pharmacists Talking with Patients: A Guide to Patient Counseling. Lippincott Williams &amp; Wilkins.</li><li>4. Straus, S.E., Glasziou, P., Richardson, W.S., dan Haynes, R.B., 2018. Evidence-Based Medicine E-Book: How to Practice and Teach EBM. Elsevier Health Sciences.</li></ol>

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5. Trinder, L. dan Reynolds, S., 2008. Evidence-Based Practice: A Critical Appraisal. Wiley.
  6. CASP. Critical Appraisal Skill Program Checklist. <https://casp-uk.net/casp-tools-checklists/>
  7. Clinical Learning Guidelines for Master of Clinical Pharmacy, Universitas Gadjah Mada
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Date of last amendment: 13 September 2021

## Module 15: Clinical Internship in Psychiatry (3 Credits)

Clinical Intership in Psychiatry	
Code/Status	: FAFK211219/Elective
Level	: Master
Semester	: 2 and 3
Course Coordinator/Lecturer	: Fita Rahmawati Zullies Ikawati
Language	: Indonesian
Teaching Method/Duration of Classes per Week for One Semester	: Practice-based Learning, 25 hours per week for 4 weeks for one semester
Workload	: 150 hours of internship for one semester
Credits	: 3 Credits
Prerequisites	: Students must have successfully completed all compulsory courses, elective courses, and clinical pharmacy case study courses. A TOEFL score of 500 is required to ensure English language proficiency for the internship program at international hospitals.
Course Learning Outcomes (CLO)	: <ol style="list-style-type: none"><li>1. Students are able to conduct medication reconciliation for patients.</li><li>2. Students are able to apply pathophysiology theories and identify Drug-Related Problems (DRPs) in patients.</li><li>3. Students are able to recommend solutions for DRPs and implement appropriate therapy monitoring.</li><li>4. Students are able to conduct medication counseling for patients.</li><li>5. Students are able to demonstrate professional attitudes and express ideas.</li></ol>
Description	: The clinical practice training involves applying a pharmaceutical care plan to psychiatric cases.
Examination Format/Assessment Methods	: Case Report/ A-E/ 10% attitude, 90% case report, presentation, and examination.
Learning Media	: Case-based learning, internship
References	: <ol style="list-style-type: none"><li>1. Charles, F. and Lacy, 2017. Drugs Information Handbook, 26 Edition, Lexi-comp drug reference handbook, USA.</li><li>2. DiPiro, J.T., Talbert, R.L., Yee, G.C., Matzke, G.R., Wells, B.G., 2017. Pharmacotherapy: A Pathophysiologic Approach, Tenth Edition. Mc Graw Hill. New York</li><li>3. Drugs.com, medscape, lexicomp</li><li>4. Clinical Learning Guidelines for Master of Clinical Pharmacy, Universitas Gadjah Mada</li></ol>

Date of last amendment: 13 September 2021

**Module 16: Clinical Toxicology (2 Credits)**

<b>Clinical Toxicology</b>	
Code/status	: FAFK211205/Elective
Level	: Master's degree
Semester	: 2
Course coordinator/lecturer	: Retno Murwanti Arief Nurrochmad Soni Siswanto
Language	: Indonesian
Teaching method/class duration per week for 1 semester	: Classroom lecture, practice-based learning, 2 hours per week, and 14 weeks in 1 semester
Course workload	: 100 minutes in the classroom, 120 minutes of structured activities, 120 minutes of weekly independent study
Course credit	: 2 credits
Prerequisite	: N/A
Course Learning Objectives/Outcomes	: <ol style="list-style-type: none"><li>1. Students are able to understand the definition of clinical toxicology, the scope of clinical toxicology, and aspects of poisoning, and identify symptoms of poisoning and the principles of toxicokinetic.</li><li>2. Students are able to explain the mechanisms of intoxication and solve problems related to the management of intoxication with central nervous system drugs, nutrition, and food.</li><li>3. Students are able to explain the mechanisms of intoxication and solve problems related to the management of intoxication with analgesics-antipyretics, antibiotics, heavy metals, and household chemical products.</li><li>4. Students are able to explain the mechanisms of intoxication and solve problems related to the management of cardiovascular drug intoxication, cocaine, alcohol, insecticides, snake venom, and environmental toxins.</li></ol>
Description	: This course educates students about various aspects of acute, intentional, and unintentional poisoning; chronic conditions in the human body; identification of poisons; diagnosis of poisoning; and appropriate therapeutic management for poisoning by drugs, pesticides, food and drink, heavy metals, and narcotics.
Test format/assessment method	: Essay and Case-based exam/ A-E/ project results/case study 72%, mid-term exam 28%
Teaching media	: Face-to-face and clinical toxicology case-based meetings, offline learning using eLOK LMS ( <a href="http://www.elok.ugm.ac.id">www.elok.ugm.ac.id</a> )

References

: Primary:

1. Goldfrank L.R., et al (editors)., 2004, Toxicologic Emergencies, 8th ed., Appleton & Lange, Norwalk.
2. Olson K.R., et al (editors), 2007, Poisoning & Drug Overdose, 5th ed., Appleton & Lange, Norwalk.
3. Stine K.E. & Brown T.M., 1996, Principles of Toxicology, CRC Press, Florida.
4. Donatus I.A., 2005, Toksikologi, Bag. Farmakologi & Farmasi Klinik, Fak. Farmasi, UGM, Yogyakarta.
5. Flanagan R.J., Braithwaite R.A., Brown S.S., Widdop B., de Wolff F.A., 1995, Basic Analytical Toxicology, WHO, Geneva, alih bahasa oleh Sri Noegrohati dkk., Pusat Informasi Obat Dan Makanan, BPOM, Jakarta.

Additional:

1. Siswanto, S and Wardhani, BWK. (2022) "Association of Environmental Pollutants Exposure with Pulmonary Fibrosis: A Mini Review of Molecular Mechanism Mediated.

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Date of last amendment: 13 September 2021



**Module 17: Pharmacoeconomics (2 Credits)**

<b>Pharmacoeconomics</b>	
Code/status	: FAFK211206/ Elective
Level	: Master's degree
Semester	: 2
Course coordinator/lecturer	: Tri Murti Andayani Dwi Endarti
Language	: Indonesian
Teaching method/class duration per week for 1 semester	: Classroom lecture, practice-based learning, 2 hours per week, and 14 weeks in 1 semester
Course workload	: 100 minutes in the classroom, 120 minutes of structured activities, 120 minutes of weekly independent study
Course credit	: 2 credits
Prerequisite	: N/A
Course Learning Objectives/Outcomes	: <ol style="list-style-type: none"><li>1. Students are able to examine drug information sources to provide evidence of efficacy, effectiveness, and side effects of drugs for pharmacoeconomic analysis.</li><li>2. Students are able to examine sources of drug information to provide data on the costs of therapy for various diseases.</li><li>3. Students are able to plan pharmacoeconomic studies to determine cost-effective therapeutic strategies.</li><li>4. Students are able to plan pharmacoeconomic studies to recommend cost-effective drug choices for various diseases.</li></ol>
Description	: This course educates students about the measurement of efficacy, effectiveness, side effects, and costs of a treatment based on current information sources; and pharmacoeconomic analysis steps (cost-minimization analysis, cost-effectiveness analysis, cost-utility analysis, and cost-benefit analysis).
Test format/assessment method	: <i>Project/case</i> 60%, presentation and discussion 40%
Teaching media	: Face-to-face meetings, group discussions, and presentations

References

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1. Bootman JL., Townsend RJ., McGhan WF. 2015, *Principles of Pharmacoeconomics*, 3<sup>rd</sup>Ed, Harvey Whitney Books Company, Cincinnati
2. Rascati KL. 2009, *Essentials of Pharmacoeconomics*, Lippincott Williams and Wilkins, Philadelphia
3. Rychlik R. 2002, *Strategies in Pharmacoeconomics and Outcomes Research*, Pharmaceutical Product Press, New York
4. Vogenberg FR. 2001, *Introduction to Applied Pharmacoeconomics*, Mc Graw-Hill Companies, USA Walley T., Haycox A., Boland A. 2004, *Pharmacoeconomics*, Churchill Livingstone, Philadelphia

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Date of last amendment: 13 September 2021

**Module 18: Emergency and Critical Care Medicine (2 Credits)**

<b>Emergency and Critical Care Medicine</b>	
Code/status	: FAFK211207/Elective
Level	: Master
Semester	: 2
Course coordinator/lecturer	: Fita Rahmawati Agung Endro Nugroho Endang Budiarti Widyati
Language	: Indonesian
Teaching method/class duration per week for 1 semester	: Classroom lecture, practice-based learning, 2 hours per week, and 14 weeks in 1 semester
Course workload	: 100 minutes in the classroom, 120 minutes of structured activities, 120 minutes of weekly independent study
Course credit	: 2 credits
Prerequisite	: N/A
Course Learning Objectives/Outcomes	: <ol style="list-style-type: none"><li>1. Students are able to understand the role of pharmacy in the management of ICU patients, integrate the pharmacological profile, pharmacokinetics, pharmacodynamics, and action mechanisms of sedative drugs, analgesics, delirium, and drug overdose and poisoning in the preparation and implementation of pharmaceutical care plans, as well as monitor drug evaluation in emergency and critically ill conditions.</li><li>2. Students are able to integrate the principles of ICU patient pathophysiology, clinical data interpretation, pharmacological profile, pharmacokinetics, pharmacodynamics, and action mechanisms of antibiotic drugs and fluid and electrolyte needs in the preparation and implementation of pharmaceutical care plans, as well as monitor drug evaluation in emergency and critically ill conditions.</li><li>3. Students are able to integrate the pharmacological profile, pharmacokinetics, pharmacodynamics, and mechanisms of action of Neuromuscular Blocking Agents, drugs in shock conditions, prokinetic drugs, and prophylaxis agents in SRMD in the preparation and implementation of pharmaceutical care plans, as well as monitor drug evaluation in emergency and critically ill conditions.</li><li>4. Students are able to integrate knowledge about medication administration (Enteral Feeding Tubes and IV lines), pharmacological profiles, pharmacokinetics, pharmacodynamics, and action mechanisms of drugs for preventing DVT and pulmonary embolism and drugs for hematologic disorders in the preparation and implementation of</li></ol>

pharmaceutical care plans, as well as monitor drug evaluation in emergency and critically ill conditions.

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Description	:	This course integrates pathophysiology principles, clinical data interpretation, pharmacological profiles, action mechanisms of emergency drugs, and pharmacotherapy to develop and implement pharmaceutical care plans, as well as monitor and evaluate drugs in emergency and critically ill conditions.
Test format/assessment method	:	Essay and case-based exam/ A-E/ presentation 25%, mid-term exam 25%, final exam 50%
Teaching media	:	Tutorial, group discussion, and presentation
References	:	<ol style="list-style-type: none"><li>1. Rang, H.P., Dale, M.M., and Ritter, J.M., 1999, Pharmacology, 4th Ed., 1-44, 94-156, Churchill Livingstone, Melbourne</li><li>2. DiPiro, J.T., Talbert, R.L., Yee, G.C., Matzke, G.R., Wells, A.G., Posey, L.M. (Eds), 2008, Pharmacotherapy a Pathophysiological Approach, 4th ed, Appleton &amp; Lange, Stamford</li><li>3. Koda-Kimble, MA., and Young, LY, 2001, Applied Therapeutics: The Clinical Use of Drugs, Lippincott Williams and Wilkins, New York.</li></ol>

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Date of last amendment: 13 September 2021

**Module 19: Oncology Therapy (2 Credits)**

<b>Oncology Therapy</b>	
Code/status	: FAFK211208/Elective
Level	: Master
Semester	: 2
Course coordinator/lecturer	: Retno Murwanti Fita Rahmawati Arief Nurrochmad
Language	: Indonesian
Teaching method/class duration per week for 1 semester	: Classroom lecture, practice-based learning, 2 hours per week, and 14 weeks in 1 semester
Course workload	: 100 minutes in the classroom, 120 minutes of structured activities, 120 minutes of weekly independent study
Course credit	: 2 credits
Prerequisite	: N/A
Course Learning Objectives/Outcomes	: <ol style="list-style-type: none"><li>1. Students are able to understand and apply knowledge about cancer biology, pathophysiology, drug pharmacology, pharmacokinetics and pharmacodynamics, and evidence-based medicine-targeted cancer therapy and immunotherapy to solve drug-related problems</li><li>2. Students are able to understand and apply knowledge about the principles of cancer treatment, drug pharmacology, pharmacokinetics and pharmacodynamics, and evidence-based medicine chemotherapy drugs to solve drug-related problems</li><li>3. Students are able to understand surgical therapy, radiation therapy and the role of pharmacists in oncology therapy, and apply knowledge about drug pharmacology, pharmacokinetics and pharmacodynamics, and pharmacotherapy in breast cancer, lung cancer, leukemia, and lymphoma in solving drug-related problems</li></ol>
Description	: This course studies the pathophysiology of cancer, pharmacological profiles, action mechanisms of drugs used in cancer therapy, radiotherapy, nuclear pharmacy, and seeks and presents the latest information based on evidence or evidence-based medicine about these drugs for application in cancer therapy.
Test format/assessment method	: Essay and case-based exam/ A-E/ presentation of case discussion results 20%, mid-term exam 50%, final exam 30%,

Teaching media : Tutorial, group discussion, and presentation

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- References :
1. Rang, H.P., Dale, M.M., and Ritter, J.M., 1999, Pharmacology, 4th Ed., 1-44, 94-156, Churchill Livingstone, Melbourne
  2. DiPiro, J.T., Talbert, R.L., Yee, G.C., Matzke, G.R., Wells, A.G., Posey, L.M. (Eds), 2008, Pharmacotherapy a Pathophysiological Approach, 4th ed, Appleton & Lange, Stamford
  3. Koda-Kimble, MA., and Young, LY, 2001, Applied Therapeutics: The Clinical Use of Drugs, Lippincott Williams and Wilkins, New York.

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Date of last amendment: 13 September 2021

## Module 20: Renal and Cardiovascular Drug Pharmacology (2 Credits)

<b>Renal and Cardiovascular Drug Pharmacology</b>	
Code/status	: FAFK211210/Elective
Level	: Master
Semester	: 2
Course coordinator/lecturer	: Fita Rahmawati Agung Endro Nugroho
Language	: Indonesian
Teaching method/class duration per week for 1 semester	: Classroom lecture, practice-based learning, 2 hours per week, and 14 weeks in 1 semester
Course workload	: 100 minutes in the classroom, 120 minutes of structured activities, 120 minutes of weekly independent study
Course credit	: 2 credits
Prerequisite	: N/A
Course Learning Objectives/Outcomes	: <ol style="list-style-type: none"><li>1. Students are able to understand and apply knowledge about drug pharmacology, pharmacokinetics, pharmacodynamics and evidence-based medicine for cardiovascular drugs, diuretics, beta-blockers, calcium blockers, ACEI, ARB, antiarrhythmics, inotropic and digitalis, centrally acting hypotensive drugs, and directly acting vasodilators to solve drug-related problems.</li><li>2. Understand and apply knowledge about drug pharmacology, pharmacokinetics, pharmacodynamics, and evidence-based medicine for cardiovascular drugs, including antihyperlipidemic, anti-anginal, antiplatelet, anticoagulant, and antithrombotic drugs, and cardiovascular drug interactions, to solve drug-related problems.</li><li>3. Understand and apply knowledge about drug pharmacology, pharmacokinetics, pharmacodynamics, and pharmacotherapy for renal disorders, including electrolytes, acid-base disorders, and antianemia, to solve drug-related problems.</li></ol>
Description	: This course studies the pharmacological profile of renal and cardiovascular drugs, including pharmacokinetics (absorption, distribution, metabolism, and excretion), pharmacodynamics (mechanism of action and target of drug action in the body), and evidence-based medicine regarding drugs for cardiovascular and renal diseases, as well as their application in the therapy of these disorders.
Test format/assessment method	: Essay and case-based exam/ A-E/ presentation 30%, mid-term exam 35%, final exam 35%
Teaching media	: Tutorial, group discussion, and presentation

References

: Primary:

1. Nugroho, AE., 2011, Farmakologi: Obat-obat penting dalam pembelajaran Ilmu Farmasi dan Kesehatan, Pustaka Pelajar Yogyakarta Indonesia
2. Rang, H.P., Dale, M.M., and Ritter, J.M., 1999, Pharmacology, 4th Ed., 1-44, 94-156, Churchill Livingstone, Melbourne
3. DiPiro, J.T., Talbert, R.L., Yee, G.C., Matzke, G.R., Wells, A.G., Posey, L.M. (Eds), 2008,

Additional:

1. Koda-Kimble, MA., and Young, LY, 2001, Applied Therapeutics: The Clinical Use of Drugs, Lippincott Williams and Wilkins, New York.
  2. Nugroho, AE., 2011, Prinsip Aksi dan Nasib Obat dalam Tubuh, Pustaka Pelajar , Yogyakarta, Indonesia
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