The following Modifications are required in the R17 Pharm.D/Pharm.D (PB) Regulations

<table>
<thead>
<tr>
<th>S.No</th>
<th>Existing &amp; Proposed change in the regulations</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>“Award of the Pharm. D (Post Baccalaureate) Degree” is to be included Under item No. 2 of the R17 regulations</td>
<td>As per R14 regulations, this may be included</td>
</tr>
<tr>
<td>2</td>
<td>“To add prefix ‘Dr.’ before the name of the candidate while awarding the degree ‘Doctor of Pharmacy’ vide regulation18 of the Pharm D regulation, 2008” is to be included as point (d) Under item No. 2 of the R17 regulations</td>
<td>As per R14 regulations, this may be included</td>
</tr>
<tr>
<td>3</td>
<td>“Note: The entire class work be spread for the entire Academic Year along with Project work and clerkship.” is to be included Under Fifth Year in the Course Structure of the R17 regulations</td>
<td>As per R14 regulations, this may be included</td>
</tr>
<tr>
<td>4</td>
<td>“Supplementary examination (advanced) may be conducted within three months after announcement of the regular examination results.” is to be included Under item No 6 (2) of the R17 regulations</td>
<td>As per R14 regulations, this may be included</td>
</tr>
</tbody>
</table>
| 5    | Existing: Attendance requirements: (Eligibility for appearing Examination) - Only such students who produce certificate from the Head of the Institution in which he or she has undergone the Pharm.D. or as the case may be, the Pharm.D. (Post Baccalaureate) course, in proof of his or her having regularly and satisfactorily undergone the course of study by attending not less than 80% of the classes held both in theory and in practical separately in each subject shall be eligible for appearing at examination. Proposed: 7. Attendance requirements:  
“A student shall be eligible to appear for University examinations if he acquires a minimum of 80% of attendance in aggregate of all the subjects in a year.  
7.1 Condonation of shortage of attendance in aggregate from 70% and above and below 80% in each year may be granted by the College Academic Committee, on medical grounds/valid reasons.  
7.2 Shortage of Attendance below 70% in aggregate shall in NO case be condoned.  
7.3 Students whose shortage of attendance is not condoned in any year are not eligible to take their end examination of that class and their registration shall stand cancelled.  
7.4 A student will not be promoted to the next year unless he/she satisfies the attendance requirements of the present year, as applicable. They may seek readmission for that year when offered next.  
7.5 A stipulated fee shall be payable towards condonation of shortage of attendance to the University.” is to be included Under item No 7 of the R17 regulations in place of the existing one. | As per R14 regulations, the existing item may be replaced with proposed item |
| 6 | **Existing:**  
Minimum marks for passing examination.— A student shall not be declared to have passed examination unless he or she secures at least 50% marks in each of the subjects separately in the theory examinations, including sessional marks and at least 50% marks in each of the practical examinations including sessional marks. The students securing 60% marks or above in aggregate in all subjects in a single attempt at the Pharm.D. or as the case may be, Pharm. D. (Post Baccalaureate) course examination shall be declared to have passed in first class. Students securing 75% marks or above in any subject or subjects shall be declared to have passed with distinction in the subject or those subjects provided he or she passes in all the subjects in a single attempt.  

**Proposed:**  
Minimum marks for passing examination:  
“A student shall not be declared to have passed examination unless he or she secures at least 50% marks in each of the subjects separately in the theory examinations, including sessional marks and at least 50% marks in each of the practical examinations including sessional marks. The students securing 60% marks or above in aggregate in all subjects at the Pharm. D or as the case may be, Pharm. D (Post Baccalaureate) course examination shall be declared to have passed in first class. Students securing 75% marks or above in aggregate in all subjects shall be declared to have passed with distinction provided the student completes the course in 6 years for Pharm. D and 3 Years for Pharm. D (Post baccalaureate). Pass class shall be awarded to such of the candidates who would have passed the examination in subsequent number of attempts after completion of 6/3 years of the course.” is to be included Under item No 10 of the R17 regulations in place of the existing one. | **As per R14 regulations, the existing item may be replaced with proposed item** |
|---|---|
| 7 | **Existing:**  
Eligibility for promotion to next year.- All students who have appeared for all the subjects and passed the first year annual examination are eligible for promotion to the second year and, so on. However, failure in more than two subjects shall debar him or her from promotion to the next year classes.  

**Proposed:**  
Eligibility for promotion to next year.-  
“All students who have appeared for all the subjects and passed the first year annual examination are eligible for promotion to the second year and, so on. However, failure in more than three subjects (excluding Remedial Mathematics/ Biology) including supplementary examinations shall debar him or her from promotion to the next year classes.”  

**Note:** At any time of the course study a student should not have failed in more than 3 subjects (excluding Remedial Mathematics/ Biology) to be eligible for promotion to next higher class. is to be included Under item No 11 of the R17 regulations in place of the existing one. | **As per PCI norms & R14 regulations, the existing item may be replaced with proposed item** |
<table>
<thead>
<tr>
<th></th>
<th>Annexure-I</th>
<th>Medicinal Chemistry (Theory) “(17T00305) existing syllabus in R17 regulations may be replaced with the proposed detailed syllabus shown in Annexure - I</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Annexure-II</td>
<td>Medicinal Chemistry (Practical) “(17T00310) existing syllabus in R17 regulations may be replaced with the proposed detailed syllabus shown in Annexure - II</td>
</tr>
<tr>
<td>10</td>
<td>Annexure-III</td>
<td>The following topics may be included in Unit-I under item (iii) in the Pharmacology (17T00301) syllabus in R17 regulations: iii) DRUGS ACTING ON GIT: a) Drugs for peptic ulcer and gastric acidity b) Anti emetics c) Drugs for constipation, diarrhea, Inflammatory Bowel Disease d) Drug for pancreatic disease</td>
</tr>
<tr>
<td>11</td>
<td>Annexure-IV</td>
<td>The following topics may be included in the units mentioned in the Pharmacotherapeutics-III (17T00401) syllabus in R17 regulations. I Unit: Pancreatitis IV Unit: Alcohol Withdrawal Syndrome</td>
</tr>
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</table>
Annexure-I

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
Pharm. D-III YEAR

(17T00305) MEDICINAL CHEMISTRY (THEORY)

Theory : 3 Hrs. /Week

1. A) Modern concept of rational drug design: A brief introduction to Quantitative Structure Activity Relationship (QSAR), prodrug, combinatorial chemistry and computer aided drug design (CADD) and concept of antisense molecules.

A study of the development of the following classes of drugs including SAR, mechanism of action, synthesis of important compounds, chemical nomenclature, brand names of important marketed products and their side effects.

B) Anti-infective agents

a) Local anti-infective agents:
Alcohols: isopropyl alcohol
Phenols: cresols, hexyl resorcinol
Cationic surfactants: benzalkonium chloride, cetylpyridinium bromide
Nitrofurans: nitrofurazone, furazolidone.
b) Antifungal agents:
Azoles: miconazole, ketoconazole, fluconazole
Miscellaneous: tolnaftate, naftifine
Antifungal Antibiotics: amphotericin, nystatin, griseofulvin.
c) Urinary tract anti-infectives:
SAR of quinolone antibacterial agents, Norfloxacin, ciprofloxacin*, sparfloxacin, ofloxacin,
d) Antitubercular agents:
Management of tuberculosis,
Synthetic anti TB agents: INH*, Pyrizinamide, ethambutol,
Anti TB antibiotics: rifampin, capreomycin
e) Antiviral agents and Anti AIDS agents:
amantadine, acyclovir, trifluridine, zidovudine, stavudine
f) Antiprotozoal agents:
Introduction to protozoal diseases and causative organisms.
Metronidazole, diloxanidefuroate, dehydroemetine, nifurtimox

g) Anthelmentics:
Benzimidazoles: mebendazole, albendazole
Piperazine, diethylcarbamazine, ivermectin

2. A) Antibiotics

- Historical background and classification of antibiotics.
  Beta lactam antibiotics: development of acid resistant and extended spectrum Penicillins. Penicillin G, ampicillin, amoxicillin, cloxacillin
Beta lactamase inhibitors: clavulanic acid, thienamycin
Cephalosporins: cephalexin, cefadroxil, cefuroxime
Aminoglycosids: streptomycin, neomycin, amikacin, gentamicin
Tetracyclines: Chemistry and SAR of tetracyclines, chlortetracycline, doxycycline, Minocycline.
Macrolides: erythromycin, azithromycin
Miscellaneous: clindamycin, bacitracin, chloramphenicol*

B) Antineoplastic agents

Historical background and classification of antineoplastic agents
Alkylating agents: cyclophosphamide, mechlorethamine, cholrambucil
Antimetabolites: mercaptopurine, flurouracil, methotrexate
Antibiotics: dactinomycin, mitomycin, streptozocin
Plant products: etoposide, taxol, vincristine and vinblastine
Miscellaneous: cisplatin, interferons

3. A) Antimalarials

Etiology of malaria, SAR and mechanism of action of quinoline
Antimalarials
Quinine sulphate, Chloroquine phosphate, amodiaquine, pamaquine*, primaquine, Quinacrine
Chloroguanide, cycloguanil, pyrimethamine

B) Sulphonamides and sulphones

History and development of sulfonamides, SAR and mechanism of action of Sulphonamides, pKa of Sulfas and Crystalluria
Sulfamethoxazole, sulfisoxazole, sulfacetamide*, sulfasalzine
Folatereductase inhibitors: trimethoprim*, synergistic action of cotrimoxazole.
Sulfones: dapsone

C) Hypoglycemic agents

History, development and SAR of sulfonylureas: tolbutamide*, chlorpropamide, glipizide
Metaglinides: repaglinide
Thiazolidinones: rosiglitazone, pioglitazone
Biguanides: metformin, phenformin
Miscellaneous: acarabose, miglitol

4. A) Cardiovascular agents

a) Antianginal agents and vasodilators
Nitrovasodilators: amyl nitrite, isosorbidedinitrate
Calcium channel blockers: verapamil, diltiazem
b) Antiarrhythmic agents:
Class I: quinidine, phenytoin, lidocaine, encainide
Class II: beta blockers- propranolol
Class III: amiodarone
Class IV: Calcium channel blockers: verapamil, diltiazem
c)Antihypertensive agents:
  betablockers: propranolol*,
  ACE inhibitors: captopril, enalapril
  Angiotensin antagonists: losartan
  Calcium channel blockers: nifedipine, amlodipine
  Adrenergic agents: clonidine, methyl dopa
  Adrenergic antagonists: prazosin, reserpine
d)Antihyperlipidemic agents: types of hyperlipoproteinemia
clofibrate, fenofibrate, cholestyramine, lovastatin, simvastatin
e)Anticoagulants: warfarin, dicumarol, anisindione

B) Diureties

  Carbonic anhydrase inhibitors: acetazolmide*
  Thiazide diuretics: SAR of thiazide diuretics, chlorthiazide, benzthiazide, xipamide, chlorthalidone
  Loop diuretics: frusemide*, ethacrynic acid
  Potassium sparing diuretics: spiranolactone,amiloride
  Miscellaneous: mannitol

5. A) Steroidal Hormones and Adrenocorticoids

  Estrogens: estradiol, DES
  Progestines: progesterone, norethindrone
  Testosterone, nandralone
  Betamethasone, prednisolone, beclomethasone

B) Thyroid and Antithyroid agents

  L-thyroxine, L-threonine
  Propyl thiouracil, methimazole

C) Diagnostic agents

  Iodipamide, diatrizoate sodium
  Aminohippurate, sulfobromphthalein, fluorescein sodium
Annexure-II

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
Pharm. D - III YEAR
(17T00310) MEDICINAL CHEMISTRY (PRACTICAL)

Practical :3 Hrs./Week

I. Assays of important drugs from the course content.
   1. Assay of ascorbic acid by cerimetry
   2. Assay of metronidazole by NAT
   3. Assay of chloroquine phosphate by NAT
   4. Assay of dapsone by diazotization
   5. Assay of INH by bromometry
   6. Assay of benzyl penicillin by iodometry
   7. Assay of analgin by iodimetry
   8. Assay of diclofenac by alkalimetry

II. Preparation of medicinally important compounds or intermediates required for synthesis of drugs
   1. Preparation of 7-hydroxy 4-methyl coumarin
   2. Preparation of phenytoin from benzoin
   3. Preparation of phenothiazine from diphenyl amine
   4. Preparation of benzyl alcohol from benzaldehyde
   5. Preparation of chlorbutanol
   6. Preparation of eosin from resorcinol
   7. Preparation of fluorescein from eosin
   8. Preparation of triphenyl imidazole from benzoin
   9. Preparation of 2,3 diphenyl quinoxaline from OPDA
  10. Preparation of benztriazole from OPDA
  11. Preparation of benzimidazoles from OPDA
  12. Preparation of sulfanilamide from acetanilide
  13. Preparation of INH
  14. Preparation of cinnamic acid

III. Monograph analysis of important drugs.
   1. Monograph analysis of ibuprofen
   2. Monograph analysis of aspirin
   3. Monograph analysis of caffeine
   4. Monograph analysis of sulfanilamide
   5. Monograph analysis of paracetamol

IV. Determination of partition coefficients, dissociation constants and molar refractivity of compounds for QSAR analysis.
Annexure-III

Detailed syllabus and lecture wise schedule:

Title of the topic

1.  i) **Pharmacology of Drugs acting on Blood and blood forming agents**
   
   a) Anticoagulants
   
   b) Thrombolytics and antiplatelet agents
   
   c) Haemopoietics and plasma expanders

   ii) **Pharmacology of drugs acting on Renal System**
   
   a) Diuretics
   
   b) Antidiuretics

   iii) **Drugs Acting on GIT:**
   
   a) Drugs for peptic ulcer and gastric acidity
   
   b) Anti emetics
   
   c) Drugs for constipation, diarrhea, Inflammatory Bowel Disease
   
   d) Drug for pancreatic disease
Annexure-IV

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/ diseases:

Title of the topic

1 **Gastrointestinal system:** Peptic ulcer disease, Gastro Esophageal Reflux Disease, Inflammatory bowel disease, Liver disorders - Alcoholic liver disease, Viral hepatitis including jaundice, and Drug induced liver disorders, Pancreatitis.

2 **Haematological system:** Anaemias, Venous thromboembolism, Drug induced blood disorders.

3 **Nervous system:** Epilepsy, Parkinsonism, Stroke, Alzheimer's disease,

4 **Psychiatry disorders:** Schizophrenia, Affective disorders, Anxiety disorders, Sleep disorders, Obsessive Compulsive disorders, Alcohol Withdrawal Syndrome.

5 Pain management including Pain pathways, neuralgias, and headaches.

Evidence Based Medicine