



**ANAND PHARMACY COLLEGE, ANAND**  
(An Autonomous College under UGC Regulations 2023)

**Managed by Shri Ramkrishna Seva Mandal**

(Approved by PCI, NAAC Accredited – A+ Grade, 3.38 CGPA)

Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm D**

Year: **II**

Course Code: **P020201TT**

Course Name: **Community Pharmacy**

Course Type: **Core**

Year of Implementation: **2024 – 25**

**Teaching and Examination Scheme:**

| Number of hours/ Week |    |   | Number of credits |    |   | Total credits | Evaluation Scheme (Marks) |           |   |   |                         |   | Total Marks |
|-----------------------|----|---|-------------------|----|---|---------------|---------------------------|-----------|---|---|-------------------------|---|-------------|
|                       |    |   |                   |    |   |               | Sessional Exams           |           |   |   | End Semester Assessment |   |             |
|                       |    |   |                   |    |   |               | Theory                    | Practical |   |   |                         |   |             |
| L                     | Tu | P | L                 | Tu | P |               | T                         | CIE       | E | T | T                       | P |             |
| 2                     | 1  | - | 4                 | 2  | - | 6             | 30                        | -         | - | - | 70                      | - | 100         |

**Scope:**

In the changing scenario of pharmacy practice in India, Community Pharmacists are expected to offer various pharmaceutical care services. In order to meet this demand, students will be learning various skills such as dispensing of drugs, responding to minor ailments by providing suitable safe medication, patient counselling, health screening services for improved patient care in the community set up.

**Course Outcomes (CO):**

Upon completion of the course student shall be able to

|     |                                                                                                  |
|-----|--------------------------------------------------------------------------------------------------|
| CO1 | Understand importance of health education and pharmaceutical care services in community settings |
| CO2 | Develop professional management skills and entrepreneurship in community pharmacy                |
| CO3 | Perform patient counselling & provide health screening services to public in community pharmacy  |
| CO4 | Recommend drug therapy for minor ailments and apply the concept of rational drug therapy         |

**Course Contents:**

Total Teaching hours: 60 hours

|               |                                                                                                                                                                                                                                                                                                      |                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Unit 1</b> | <b>Introduction to community pharmacy:</b> Definition, scope of community pharmacy, Roles and responsibilities of Community pharmacist                                                                                                                                                               | <b>2 hours</b> |
| <b>Unit 2</b> | <b>Community Pharmacy Management</b><br>a) Selection of site, Space layout, and design<br>b) Staff, Materials- coding, stocking<br>c) Storage conditions, Purchase order<br>d) Legal requirements<br>e) Maintenance of various registers<br>f) Use of Computers: Business and health care soft wares | <b>8 hours</b> |
| <b>Unit 3</b> | <b>Prescriptions</b><br>a) Parts of prescription<br>b) Legality<br>c) Identification of medication related problems like drug interactions                                                                                                                                                           | <b>4 hours</b> |

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|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                | d) Prescription audit in community as per WHO drug use indicators: Core prescribing indicators, patient care indicators, facility indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |
| <b>Unit 4</b>  | <b>Inventory control in community pharmacy</b><br>a) Definition<br>b) Various methods of Inventory Control<br>c) ABC analysis<br>d) VED analysis<br>e) EOQ analysis<br>f) Lead time<br>g) Safety stock                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>6 hours</b> |
| <b>Unit 5</b>  | <b>Pharmaceutical care</b><br>a) Definition and Principles of Pharmaceutical care<br>b) SOAP note<br>c) FARM note<br>d) PRIME note                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>3 hours</b> |
| <b>Unit 6</b>  | <b>Patient counselling</b><br>a) Definition<br>b) Outcomes<br>c) Various stages<br>d) Barriers<br>e) Strategies to overcome barriers<br>f) Patient information leaflets- content, design, & layouts<br>g) Advisory labels                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>5 hours</b> |
| <b>Unit 7</b>  | <b>Patient medication adherence</b><br>a) Definition<br>b) Factors affecting medication adherence<br>c) Role of pharmacist in improving the adherence<br>d) Medication adherence measurement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>4 hours</b> |
| <b>Unit 8</b>  | <b>Health screening services</b><br>a) Definition<br>b) Importance<br>c) Methods for screening Blood pressure/ blood sugar/ lung function and Cholesterol testing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>4 hours</b> |
| <b>Unit 9</b>  | <b>OTC Medication</b><br>a) Definition<br>b) OTC medication list & Counselling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>3 hours</b> |
| <b>Unit 10</b> | <b>Health Education</b><br>a) WHO Definition of health (physical, mental and social health), and health promotion<br>b) Determinants of health, indicators of health, concept of disease and disorder<br>c) Care for children, pregnant & breastfeeding women, and geriatric patients.<br>d) <b>Commonly occurring Communicable Diseases, causative agents, Clinical presentations and prevention of communicable diseases</b> – Tuberculosis, Hepatitis, Typhoid, Amoebiasis, Malaria, Leprosy, Syphilis, Gonorrhea and AIDS<br>e) <b>Balance diet, and treatment &amp; prevention of deficiency disorders</b><br>f) <b>Family planning</b> – Various methods of contraception's and role of | <b>9 hours</b> |

|                |                                                                                                                                                                                                                                                                                                                                                                        |                |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                | pharmacist                                                                                                                                                                                                                                                                                                                                                             |                |
| <b>Unit 11</b> | <b>Responding to symptoms of minor ailments</b><br>a. Relevant pathophysiology, common drug therapy to: Pain, GI disturbances (Nausea, Vomiting, Dyspepsia, diarrhea, constipation), Pyrexia, Ophthalmic symptoms, worms infestations.<br>b. First Aid: Emergency treatment in shock, burns, snake bite, poisoning, heart disease, fracture and resuscitation methods. | <b>6 hours</b> |
| <b>Unit 12</b> | <b>Essential Drugs concept and Rational Drug Therapy</b><br><b>Role of community pharmacist</b>                                                                                                                                                                                                                                                                        | <b>4 hours</b> |
| <b>Unit 13</b> | <b>Code of ethics for community pharmacists</b>                                                                                                                                                                                                                                                                                                                        | <b>2 hours</b> |

### Tutorials

Tutorials will be based on above syllabus

**Teaching hours: 30 Hours**

### Special requirements:

1. Either the college is having model community pharmacy (meeting the schedule N requirement) or sign MoU with at least 4-5 community pharmacies nearby to the college for training the students on dispensing and counselling activities.
2. Students can be oriented/ trained about pharmacy store layout, legal requirements, list of drugs and items sold, storage conditions, software, inventory control, prescription handling, patient information leaflets, etc. as per below suggested module
3. Students can be trained for using special equipments like B.P apparatus, Glucometer, Peak flow meter and methods for cholesterol estimation.

### Module for drug store training:

| Sr. No. | List of Activities to be Performed                                                                                                                                                                  |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | Briefing of Community Pharmacy Store                                                                                                                                                                |
| 2       | Layout of Community Pharmacy Store                                                                                                                                                                  |
| 3       | License(s) and Documents available in community pharmacy store                                                                                                                                      |
| 4       | Arrangements of inventories in community pharmacy store                                                                                                                                             |
| 5       | List of drugs, cosmetics, nutritional products, surgical items and vaccines available at community pharmacy store (detailed study of contents, route of administration, indications of the product) |
| 6       | Introduction to legal aspects of community pharmacy store                                                                                                                                           |
| 7       | List of available OTC medications                                                                                                                                                                   |
| 8       | Briefing of Storage conditions of medications and its disposal techniques                                                                                                                           |
| 9       | List of Drugs/Items stored in Refrigerator                                                                                                                                                          |
| 10      | List of Registers maintained in Community Pharmacy Store                                                                                                                                            |
| 11      | Software used in Pharmacy Store                                                                                                                                                                     |
| 12      | List of Look Alike and Sound Alike (LASA) Medications                                                                                                                                               |
| 13      | Overview of Inventory Control and billing system                                                                                                                                                    |
| 14      | Methods of prescription filling                                                                                                                                                                     |
| 15      | Evaluation of prescription for rationality and probable drug interactions (analyzing the prescription for and probable drug interaction and convey to the concerned personnel)                      |

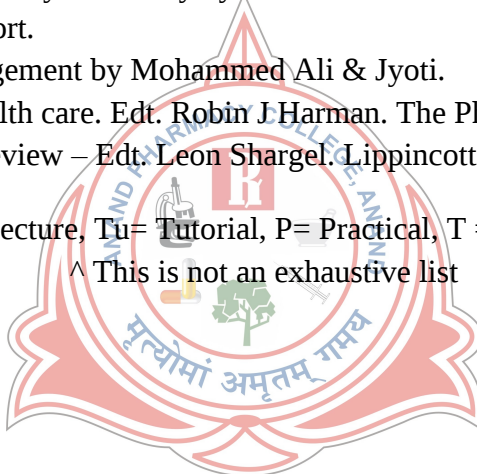
|    |                                                                                                                              |
|----|------------------------------------------------------------------------------------------------------------------------------|
| 16 | Methods of dispensing of medicine                                                                                            |
| 17 | Counseling of patients for proper usage of medicine                                                                          |
| 18 | Health screening services in Community Pharmacy                                                                              |
| 19 | Pharmaceutical Care to patients with more emphasis on Pediatric, Geriatric, pregnant and lactating population                |
| 20 | Preparation of Patient Education material (Pictograms, Patient Information Leaflets, pharmaceutical care notes, charts etc.) |
| 21 | Various Schedules under Drugs and cosmetic act                                                                               |
| 22 | List of banned and withdrawn drugs                                                                                           |
| 23 | Training on various equipment (Sphygmomanometer, glucometer, pulse oximeter, peak flow meter, thermometer)                   |

### Recommended Books^: (Latest Editions)

1. Essentials of Community Medicine—A Practical Approach, Hiremath Lalita D, Hiremath Dhananjaya A, JAYPEE Publications
2. Park Textbook of Preventive and Social Medicine, K Park, BANARSIDAS BHANOT PUBLISHERS
3. Community Pharmacy Practice, Ramesh Adepu, BSP publishers, Hyderabad
4. Health Education and Community Pharmacy by N.S.Parmar.
5. WHO consultative group report.
6. Drug store & Business management by Mohammed Ali & Jyoti.
7. Handbook of pharmacy – health care. Edt. Robin J Harman. The Pharmaceutical press.
8. Comprehensive Pharmacy Review – Edt. Leon Shargel. Lippincott Williams &Wilkins.

L= Lecture, Tu= Tutorial, P= Practical, T = Theory

^ This is not an exhaustive list



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Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm D**

Year: **II**

Course Code: **P020202TT**

Course Name: **Pharmacology I**

Course Type: **Core**

Year of Implementation: **2024-25**

**Teaching and Examination Scheme:**

| Number of hours/ Week |    |   | Number of credits |    |   | Total credits | Evaluation Scheme (Marks) |           |   |   |                         |   | Total Marks |
|-----------------------|----|---|-------------------|----|---|---------------|---------------------------|-----------|---|---|-------------------------|---|-------------|
|                       |    |   |                   |    |   |               | Sessional Exams           |           |   |   | End Semester Assessment |   |             |
|                       |    |   |                   |    |   |               | Theory                    | Practical |   |   |                         |   |             |
| L                     | Tu | P | L                 | Tu | P |               | T                         | CIE       | E | T | T                       | P |             |
| 3                     | 1  | - | 6                 | 2  | - | 8             | 30                        | -         | - | - | 70                      | - | 100         |

**Scope:**

This subject will provide an opportunity for the student to learn about the drug with regard to classification, pharmacodynamic and pharmacokinetic aspects, adverse effects, uses, dose, route of administration, precautions, contraindications and interaction with other drugs. In this subject, apart from general pharmacology, drugs acting on autonomic nervous system, cardiovascular system, central nervous system, blood and blood forming agents and renal system will be taught.

**Course Outcomes (CO):**

Upon completion of the course student shall be able to

|     |                                                                                              |
|-----|----------------------------------------------------------------------------------------------|
| CO1 | Understand the general pharmacokinetic & pharmacodynamic concepts                            |
| CO2 | Describe the pharmacology of drugs acting on nervous system                                  |
| CO3 | Illustrate the pharmacology of drugs acting on cardiovascular & respiratory system           |
| CO4 | Utilize the knowledge of the pharmacology of autacoids and drugs modulating endocrine system |

**Course Contents:**

Total Teaching hours: 90 hours

| Unit 1 | General Pharmacology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 16 hours |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
|        | a) Introduction, definitions and scope of pharmacology<br>b) Routes of administration of drugs<br>c) Pharmacokinetics (absorption, distribution, metabolism and excretion)<br>d) Pharmacodynamics<br>e) Factors modifying drug effects<br>f) Drug toxicity - Acute, sub- acute and chronic toxicity.<br>g) Pre-clinical evaluations<br>h) Drug interactions<br>Note: The term Pharmacology used here refers to the classification, mechanism of action, pharmacokinetics, pharmacodynamics, adverse effects, |          |

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|               | contraindications, Therapeutic uses, interactions and dose and route of administration                                                                                                                                                                                                                                                  |                 |
| <b>Unit 2</b> | <b>Pharmacology of drugs acting on ANS</b><br>a) Adrenergic and antiadrenergic drugs<br>b) Cholinergic and anticholinergic drugs<br>c) Neuromuscular blockers<br>d) Mydriatics and miotics<br>e) Drugs used in myasthenia gravis<br>f) Drugs used in Parkinsonism                                                                       | <b>16 hours</b> |
| <b>Unit 3</b> | <b>Pharmacology of drugs acting on cardiovascular system</b><br>a) Antihypertensive drugs<br>b) Anti-anginal drugs<br>c) Anti-arrhythmic drugs<br>d) Drugs used for therapy of Congestive Heart Failure<br>e) Drugs used for hyperlipidemias                                                                                            | <b>16 hours</b> |
| <b>Unit 4</b> | <b>Pharmacology of drugs acting on Central Nervous System</b><br>a) General anesthetics<br>b) Sedatives and hypnotics<br>c) Anticonvulsants<br>d) Analgesic and anti-inflammatory agents<br>e) Psychotropic drugs<br>f) Alcohol and methyl alcohol<br>g) CNS stimulants and cognition enhancers<br>h) Pharmacology of local anesthetics | <b>16 hours</b> |
| <b>Unit 5</b> | <b>Pharmacology of Drugs acting on Respiratory tract</b><br>a) Bronchodilators<br>b) Mucolytics<br>c) Expectorants<br>d) Antitussives<br>e) Nasal Decongestants                                                                                                                                                                         | <b>08 hours</b> |
| <b>Unit 6</b> | <b>Pharmacology of Hormones and Hormone antagonists</b><br>a) Thyroid and Antithyroid drugs<br>b) Insulin, Insulin analogues and oral hypoglycemic agents<br>c) Sex hormones and oral contraceptive<br>d) Oxytocin and other stimulants and relaxants                                                                                   | <b>10 hours</b> |
| <b>Unit 7</b> | <b>Pharmacology of autacoids and their antagonists</b><br>a) Histamine and Antihistaminics<br>b) 5-Hydroxytryptamine and its antagonists<br>c) Lipid derived autacoids and platelet activating factor                                                                                                                                   | <b>08 hours</b> |

### Tutorials

Teaching hours: 30 Hours

Tutorials will be based on above syllabus

### Recommended Books^: (Latest Editions)

1. Tripathi, K. D. Essentials of medical pharmacology. Publisher: Jaypee, Delhi.
2. Satoskar, R.S. and Bhadarkar, S.D. Pharmacology and pharmacotherapeutics. Publisher: Popular Prakashan

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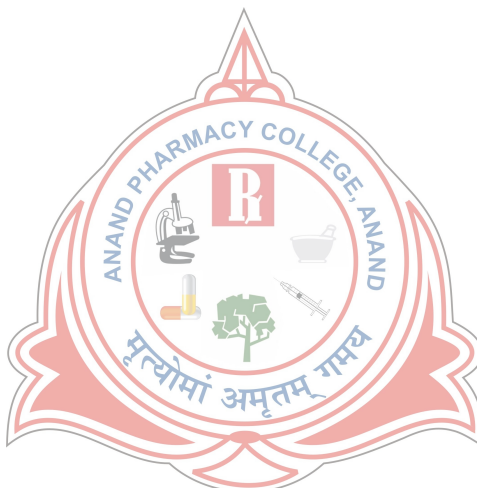
3. Rang, H.P. & Dale, M.M. Pharmacology. Publisher: Churchill Living stone.
4. Goodman Gilman, A., Rall, T.W., Nies, A.I.S. and Taylor, P. Goodman and Gilman's The pharmacological Basis of therapeutics. Publisher Mc Graw Hill, Pergamon press.
5. Craig, C.R.& Stitzel, R.E. Modern Pharmacology. Publisher: Little Brown. Co.
6. Katzung, B.G. Basic and clinical pharmacology. Publisher: Prentice Hall, Int.
7. Shargel and Leon. Applied Biopharmaceutics and pharmacokinetics. Publisher: Prentice Hall, London.

L= Lecture, Tu= Tutorial, P= Practical, T = Theory

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Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm D**

Year: **II**

Course Code: **P020203TP**

Course Name: **Pharmacotherapeutics I**

Course Type: **Core**

Year of Implementation: **2024-25**

**Teaching and Examination Scheme:**

| Number of hours/<br>Week |    |   | Number of<br>credits |    |   | Total<br>credits | Evaluation Scheme (Marks) |           |    |    |                            |    | Total<br>Marks |
|--------------------------|----|---|----------------------|----|---|------------------|---------------------------|-----------|----|----|----------------------------|----|----------------|
|                          |    |   |                      |    |   |                  | Sessional Exams           |           |    |    | End Semester<br>Assessment |    |                |
|                          |    |   |                      |    |   |                  | Theory                    | Practical |    |    |                            |    |                |
| L                        | Tu | P | L                    | Tu | P |                  | T                         | CIE       | E  | T  | T                          | P  |                |
| 3                        | 1  | 3 | 6                    | 2  | 3 | 11               | 30                        | 10        | 20 | 30 | 70                         | 70 | 200            |

**Scope:**

This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. The chapters cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.

**Course Outcomes (CO):**

Upon completion of the course student shall be able to

|     |                                                                                                    |
|-----|----------------------------------------------------------------------------------------------------|
| CO1 | Understand the epidemiology & etiology of selected diseases                                        |
| CO2 | Illustrate the pathophysiology of selected diseases                                                |
| CO3 | Summarize the clinical presentations of the diseases                                               |
| CO4 | Plan and optimize individualized therapeutic approach based on diagnosis                           |
| CO5 | Participate in ward round and conduct patient medication history interview and patient counselling |
| CO6 | Perform critical analysis of the case to identify drug related problem and suggest its remedies    |

**Course Contents:**

Total Teaching hours: 90 hours

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/ diseases

|               |                                                                                                                                                                                                            |                 |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>Unit 1</b> | <b>Cardiovascular system:</b><br>a) Hypertension,<br>b) Congestive cardiac failure<br>c) Angina Pectoris<br>d) Myocardial infarction<br>e) Hyperlipidemia<br>f) Electrophysiology of heart and Arrhythmias | <b>28 hours</b> |
| <b>Unit 2</b> | <b>Respiratory system:</b><br>a) Introduction to Pulmonary function test<br>b) Asthma                                                                                                                      | <b>19 hours</b> |

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|---------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|               | c) Chronic obstructive airways disease<br>d) Drug induced pulmonary diseases.                                                                  |                 |
| <b>Unit 3</b> | <b>Endocrine system:</b><br>a) Diabetes<br>b) Thyroid diseases<br>c) Oral contraceptives<br>d) Hormone replacement therapy<br>e) Osteoporosis. | <b>20 hours</b> |
| <b>Unit 4</b> | <b>General prescribing guidelines for</b><br>a) Pediatric patients<br>b) Geriatric patients<br>c) Pregnancy and breast feeding                 | <b>08 hours</b> |
| <b>Unit 5</b> | <b>Ophthalmology:</b><br>a) Glaucoma,<br>b) Conjunctivitis- viral & bacterial.                                                                 | <b>09 hours</b> |
| <b>Unit 6</b> | <b>Introduction to rational drug use</b><br>Definition, Role of pharmacist Essential drug concept Rational drug formulations                   | <b>06 hours</b> |

### Tutorials

Tutorials will be based on above syllabus

**Teaching hours: 30 Hours**

### Practicals:

Hospital postings in various departments designed to complement the lectures by providing practical clinical discussion; attending ward rounds; follow up the progress and changes made in drug therapy in allotted patients; case presentation upon discharge.

Students are required to maintain a record of cases presented and the same should be submitted at the end of the course for evaluation.

A minimum of 20 cases should be presented and recorded covering most common diseases.

### Assignments:

Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent developments in drug therapy of various diseases. A minimum of THREE assignments [1500 - 2000 words] should be submitted for evaluation.

### Format of the assignment:

1. Minimum & Maximum number of pages.
2. Reference(s) shall be included at the end.
3. Assignment can be a combined presentation at the end of the academic year.
4. It shall be computer draft copy.
5. Name and signature of the student.
6. Time allocated for presentation may be 8+2 Min.

### Scheme of Practical Examination:

|          | <b>Internal/ Sessional</b> | <b>External</b> |
|----------|----------------------------|-----------------|
| Synopsis | 05                         | 15              |

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|                   |                |                |
|-------------------|----------------|----------------|
| Major Experiment  | 10             | 25             |
| Minor Experiment  | 03             | 15             |
| Viva              | 02             | 15             |
| <b>Max. marks</b> | <b>20</b>      | <b>70</b>      |
| <b>Duration</b>   | <b>3 hours</b> | <b>4 hours</b> |

Note: Total sessional marks are 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

#### **Recommended Books<sup>^</sup>: (Latest Editions)**

1. Roger and Walker, Clinical Pharmacy and Therapeutics - Publication: Churchill Livingstone.
2. Joseph T. Dipiro et al. Appleton & Lange, Pharmacotherapy: A Pathophysiologic approach.
3. Robins SL, W.B., Pathologic basis of disease, Saunders publication.
4. Pathology and therapeutics for Pharmacists: A Basis for Clinical Pharmacy Practice - Green and Harris, Chapman and Hall publication.
5. Eric T. Herfindal, Clinical Pharmacy and Therapeutics - Williams and Wilkins Publication.
6. Lloyd Young and Koda-Kimble MA, Applied Therapeutics: The clinical Use of Drugs.
7. Avery's Drug Treatment, 1997, Adis International Limited.
8. Relevant review articles from recent medical and pharmaceutical literature.

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Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm D**

Year: **II**

Course Code: **P020204TT**

Course Name: **Pathophysiology**

Course Type: **Core**

Year of Implementation: **2024-25**

**Teaching and Examination Scheme:**

| Number of hours/<br>Week |    |   | Number of<br>credits |    |   | Total<br>credits | Evaluation Scheme (Marks) |           |   |   |                            |   | Total<br>Marks |
|--------------------------|----|---|----------------------|----|---|------------------|---------------------------|-----------|---|---|----------------------------|---|----------------|
|                          |    |   |                      |    |   |                  | Sessional Exams           |           |   |   | End Semester<br>Assessment |   |                |
|                          |    |   |                      |    |   |                  | Theory                    | Practical |   |   |                            |   |                |
| L                        | Tu | P | L                    | Tu | P |                  | T                         | CIE       | E | T | T                          | P |                |
| 3                        | 1  | - | 6                    | 2  | - | 8                | 30                        | -         | - | - | 70                         | - | 100            |

**Scope:**

This course is designed to impart a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications, and understanding of basic pathophysiological mechanisms involved in various diseases. Hence it will not only help to study the syllabus of pathology, but also to get baseline knowledge of its application in other subject of pharmacy.

**Course Outcomes (CO):**

Upon completion of the course student shall be able to

|     |                                                                                                                                       |
|-----|---------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Utilise the principles of cell injury, inflammation and tumor in pathophysiological context                                           |
| CO2 | Apply the concept of immunity and its correlation with physiological and pathological state in the human body.                        |
| CO3 | Understand etiology, pathophysiology, clinical manifestations and complications of diseases affecting cardiovascular & nervous system |
| CO4 | Illustrate etiology, pathophysiology, clinical manifestations and complications of infectious diseases & nutritional disorders.       |

**Course Contents:**

Total Teaching hours: 90 hours

|               |                                                                                                                                                                                                             |                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>Unit 1</b> | <b>Basic principles of cell injury and Adaptation</b><br>a) Causes, Pathogenesis and morphology of cell injury<br>b) Abnormalities in lipoproteinaemia, glycogen infiltration and glycogen storage diseases | <b>6 hours</b>  |
| <b>Unit 2</b> | <b>Inflammation</b><br>a) Pathogenesis of acute inflammation, Chemical mediators in inflammation, Types of chronic inflammation<br>b) Repairs of wounds in the skin, factors influencing healing of wounds  | <b>6 hours</b>  |
| <b>Unit 3</b> | <b>Diseases of Immunity</b><br>a) Introduction to T and B cells                                                                                                                                             | <b>10 hours</b> |

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|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|               | b) MHC proteins or transplantation antigens<br>c) Immune tolerance <ul style="list-style-type: none"> <li>– Hypersensitivity: Hypersensitivity type I, II, III, IV, Biological significance, Allergy due to food, chemicals and drugs</li> <li>– Autoimmunity: Criteria for autoimmunity, Classifications of</li> <li>– autoimmune diseases in man, mechanism of autoimmunity, Transplantation and immunologic tolerance, allograft rejections, transplantation antigens, mechanism of rejection of allograft.</li> <li>– Acquired immune deficiency syndrome (AIDS)</li> <li>– Amyloidosis</li> </ul> |                 |
| <b>Unit 4</b> | <b>Cancer:</b> differences between benign and malignant tumors, Histological diagnosis of malignancy, invasions and metastasis, patterns of spread, disturbances of growth of cells, classification of tumors, general biology of tumors, spread of malignant tumors, etiology and pathogenesis of cancer.                                                                                                                                                                                                                                                                                             | <b>09 hours</b> |
| <b>Unit 5</b> | Types of shock, mechanisms, stages and management.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>04 hours</b> |
| <b>Unit 6</b> | Biological effects of radiation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>03 hours</b> |
| <b>Unit 7</b> | <b>Environmental and nutritional diseases</b> <ol style="list-style-type: none"> <li>Air pollution and smoking- SO<sub>2</sub>, NO, NO<sub>2</sub>, and CO</li> <li>Protein calorie malnutrition, vitamins, obesity, pathogenesis of starvation</li> </ol>                                                                                                                                                                                                                                                                                                                                             | <b>07 hours</b> |
| <b>Unit 8</b> | <b>Pathophysiology of common diseases</b> <ol style="list-style-type: none"> <li>Parkinsonism</li> <li>Schizophrenia</li> <li>Depression and mania</li> <li>Hypertension,</li> <li>Stroke (ischaemic and hemorrhage)</li> <li>Angina, CCF, Atherosclerosis, Myocardial infarction</li> <li>Diabetes Mellitus</li> <li>Peptic ulcer and inflammatory bowel diseases</li> <li>Cirrhosis and Alcoholic liver diseases</li> <li>Acute and chronic renal failure</li> <li>Asthma and chronic obstructive airway diseases</li> </ol>                                                                         | <b>25 hours</b> |
| <b>Unit 9</b> | <b>Infectious diseases:</b> <ol style="list-style-type: none"> <li>Sexually transmitted diseases (HIV, Syphilis, Gonorrhea),</li> <li>Urinary tract infections</li> <li>Pneumonia</li> <li>Typhoid</li> <li>Tuberculosis</li> <li>Leprosy</li> <li>Malaria</li> <li>Dysentery (bacterial and amoebic),</li> <li>Hepatitis- infective hepatitis.</li> </ol>                                                                                                                                                                                                                                             | <b>20 hours</b> |

### Tutorials

Tutorials will be based on above syllabus

### Assignments:

Teaching hours: 30 Hours

  
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Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent advancement in pathophysiology of various diseases. A minimum of ONE assignment [1500 - 2000 words] should be submitted for evaluation

### Topics of the assignment

1. Chemical Mediators of inflammation
2. Drug Hypersensitivity
3. Cigarette smoking & its ill effects
4. Biological Effects of Radiation
5. Etiology and hazards of obesity
6. Complications of diabetes
7. Diagnosis of cancer
8. Disorders of vitamins
9. Methods in Pathology-Laboratory values of clinical significance
10. Pathophysiology of Dengue Hemorrhagic Fever (DHF)

### Format of the assignment

1. Minimum & Maximum number of pages.
2. Reference(s) shall be included at the end.
3. Assignment can be a combined presentation at the end of the academic year
4. It shall be computer draft copy.
5. Name and signature of the student
6. Time allocated for presentation may be 8+2 Min

### Recommended Books<sup>^</sup>: (Latest Editions)

1. Cotran, Kumar, Robbins Pathologic basis of disease
2. Text book of Pathology- Harsh Mohan
3. Text book of Pathology- Y.M. Bhide
4. Roger Walker; Clinical Pharmacy and Therapeutics; Churchill Livingstone publication

L= Lecture, Tu= Tutorial, P= Practical, T = Theory

<sup>^</sup> This is not an exhaustive list



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 Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm D**

Year: **II**

Course Code: **P020205TP**

Course Name: **Pharmaceutical Microbiology**

Course Type: **Core**

Year of Implementation: **2024-25**

**Teaching and Examination Scheme:**

| Number of hours/ Week |    |   | Number of credits |    |   | Total credits | Evaluation Scheme (Marks) |           |    |    |                     |    | Total Marks |
|-----------------------|----|---|-------------------|----|---|---------------|---------------------------|-----------|----|----|---------------------|----|-------------|
|                       |    |   |                   |    |   |               | Sessional Exams           |           |    |    | Term End Assessment |    |             |
|                       |    |   |                   |    |   |               | Theory                    | Practical |    |    |                     |    |             |
| L                     | Tu | P | L                 | Tu | P |               | T                         | CIE       | E  | T  | T                   | P  |             |
| 3                     | 1  | 3 | 6                 | 2  | 3 | 11            | 30                        | 10        | 20 | 30 | 70                  | 70 | 200         |

**Scope:**

Microbiology has always been an essential component of pharmacy curriculum. This is because of the relevance of microbiology to pharmaceutical sciences and more specifically to pharmaceutical industry. Pharmaceutical biotechnology is the logical extension of pharmaceutical microbiology, which is expected to change the complete drug product scenario in the future. This course deals with the various aspects of microorganisms, its classification, morphology, laboratory cultivation identification and maintenance. It's also discusses with sterilization of pharmaceutical products, equipment, media etc. The course further discusses the immunological preparations, diseases its transmission, diagnosis, control and immunological tests.

**Course Outcomes (CO):**

Upon completion of the course student shall be able to

|     |                                                                                                                                                                                                            |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand the basic concept of microbiology and microorganism.                                                                                                                                            |
| CO2 | Analyze the importance of disinfection and sterilization in pharmaceutical industry.                                                                                                                       |
| CO3 | Demonstrate the importance of immunity and apply the knowledge of microbiological assay of antibiotics and vitamins in pharmaceutical field.                                                               |
| CO4 | Recognize the fundamentals of infectious disease and its diagnosis.                                                                                                                                        |
| CO5 | Recall principles and techniques of experimental microbiology.                                                                                                                                             |
| CO6 | Acquire skills related to cultivation, isolation, identification of microbes, its sterilization and sterility testing and microbiological assay of antibiotics and vitamins and efficacy of disinfectants. |

**Detailed Syllabus:**

Total Teaching hours: **90 hours**

|          |                                                                                                                |                 |
|----------|----------------------------------------------------------------------------------------------------------------|-----------------|
| <b>1</b> | Introduction to the science of microbiology. Major divisions of microbial world and Relationship among them.   | <b>05 hours</b> |
| <b>2</b> | Different methods of classification of microbes and study of Bacteria, Fungi, virus, Rickettsiae, Spirochetes. | <b>05 hours</b> |

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|    |                                                                                                                                                                                                                                                                                                                                                                                                  |          |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 3  | Nutritional requirements, growth and cultivation of bacteria and virus. Study of different important media required for the growth of aerobic and anaerobic bacteria & fungi. Differential media, enriched media and selective media, maintenance of lab cultures.                                                                                                                               | 10 hours |
| 4  | Different methods used in isolation and identification of bacteria with emphasis to different staining techniques and biochemical reactions. Counting of bacteria -Total and Viable counting techniques.                                                                                                                                                                                         | 10 hours |
| 5  | Detailed study of different methods of sterilization including their merits and demerits. Sterilization methods for all pharmaceutical products. Detailed study of sterility testing of different pharmaceutical preparations. Brief information on Validation.                                                                                                                                  | 10 hours |
| 6  | Disinfectants- Study of disinfectants, antiseptics, fungicidal and virucidal agents factors affecting their activation and mechanism of action. Evaluation of bactericidal, bacteriostatic, virucidal activities, evaluation of preservatives in pharmaceutical preparations.                                                                                                                    | 12 hours |
| 7  | Immunology- Immunity, Definition, Classification, General principles of natural immunity, Phagocytosis, acquired immunity (active and passive). Antigens, chemical nature of antigens structure and formation of Antibodies, Antigen-Antibody reactions. Bacterial exotoxins and endotoxins. Significance of toxoids in active immunity, Immunization Programme, and importance of booster dose. | 14 hours |
| 8  | Diagnostic tests: Schick's Test, Elisa test, Western Blot test, Southern Blot PCR Widal, QBC, Mantaux Peripheral smear, Study of malarial parasite.                                                                                                                                                                                                                                              | 08 hours |
| 9  | Microbial culture sensitivity Testing: Interpretation of results Principles and methods of different microbiological assays, microbiological assay of Penicillin, Streptomycin and vitamin B2 and B12. Standardization of vaccines and sera.                                                                                                                                                     | 08 hours |
| 10 | Study of infectious diseases: Typhoid, Tuberculosis, Malaria, Cholera, Hepatitis, Meningitis, Syphilis & Gonorrhea and HIV.                                                                                                                                                                                                                                                                      | 08 hours |

### Tutorials

Tutorials will be based on above syllabus.

**Tutorial hours: 30 Hours**

### Practical (3 Hours/ Week, Total: 90 Hours)

#### List of Practicals

1. Study of apparatus used in experimental microbiology\*.
2. Preparation of media and learn sterilization. \*
3. Staining techniques – Simple staining;
4. Staining techniques – Gram's staining;
5. Staining techniques – Negative staining\*\*
6. Morphology of spirochetes by Negative staining method
7. Study of motility characters\*.
8. Enumeration of micro-organisms (Total) \*
9. Enumeration of micro-organisms (Viable)
10. Study of the methods of isolation of pure culture. – pour plate \*
11. Study of the methods of isolation of pure culture. – Streak Plate \*
12. Study of the methods of isolation of pure culture. – Spread Plate\*
13. Bio chemical testing for the identification of micro\*-organisms.

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14. Cultural sensitivity testing for some micro-organisms. \*
15. Sterility testing for powders
16. Sterility testing of aqueous solution without bactericide.
17. Sterility testing for liquids. \*
18. Sterility testing for surgical. \*
19. Determination of minimum inhibitory concentration. – One level assay \*
20. Determination of minimum inhibitory concentration. – Two level assay \*
21. Microbiological assay of antibiotics by cup plate method. \*
22. Microbiological assay of vitamins by Turbidometric method\*\*
23. Determination of RWC. \*\*
24. Diagnostic tests for some common diseases, widal, malarial parasite. \*\*
25. Demonstration of Anaerobic culture jar.
26. Fermentation of grapes.
27. Fermentation of Wheat.

\* Indicate minor experiment & \*\* indicate major experiment.

### Scheme of Practical Examination

| Item              | Internal/<br>Sessional | External       |
|-------------------|------------------------|----------------|
| Synopsis          | 05                     | 15             |
| Major Experiment  | 10                     | 25             |
| Minor Experiment  | 03                     | 15             |
| Viva              | 02                     | 15             |
| <b>Max. marks</b> | <b>20</b>              | <b>70</b>      |
| <b>Duration</b>   | <b>3 hours</b>         | <b>4 hours</b> |

Note: Total sessional marks are 30 (20 for practical sessional plus 10 marks for CIE)

### Assignments:

1. Visit to some pathological laboratories & study the activities and equipment/instruments used and reporting the same.
2. Visit to milk dairies (Pasteurization) and microbial laboratories (other sterilization methods) & study the activities and equipment/instruments used and reporting the same.
3. Library assignments
  - a. Report of recent microbial techniques developed in diagnosing some common diseases.
  - b. Latest advancement developed in identifying, cultivating & handling of microorganisms.

### Format of the assignment:

1. Minimum & Maximum number of pages.
2. It shall be computer draft copy.
3. Reference(s) shall be included at the end.
4. Name and signature of the student.
5. Assignment can be a combined presentation at the end of the academic year.
6. Time allocated for presentation may be 8+2 Min.

### Recommended Books^: (Latest Editions)

1. Vanitha Kale and Kishor Bhusari "Applied Microbiology" Himalaya Publishing house Mumbai. Latest Edition
2. Mary Louis Turgeon "Immunology and Serology in Laboratory Medicine" Latest Edition Mosby- Year

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book Inc. St. Louis Missouri 63146.

3. Harsh Mohan, "Text book of Pathology" Latest Edition, B-3 Ansari Road Darya Ganj N. Delhi.
4. Chandrakanth Kokare. Pharmaceutical Microbiology experiments and techniques. Latest edition. Career Publications.
5. Prescott L.M., Jarley G.P Klein D.A "Microbiology" Latest Edition Mc Graw Hill Company Inc.
6. Rawlins E.A. "Bentley's Text Book of Pharmaceutics" Bailliere Tindal's 24-28 London Latest Edition.
7. Forbisher "Fundamentals of Microbiology" Philadelphia W.B. Saunders. Latest Edition d.
8. Prescott L.M. Jarley G.P., Klein.D.A. "Microbiology." WMC Brown Publishers, Oxford. Latest Edition
9. War Roitt, Jonathan Brostoff, David male, "Immunology" Latest Edition, Mosby-year book Europe Ltd, London.
10. Pharmacopoeia of India, Govt of India, Latest Editions.

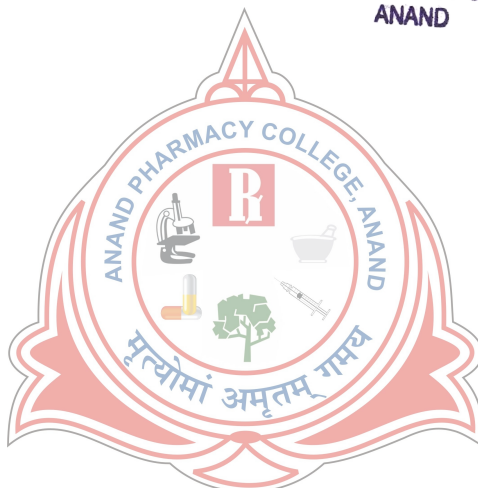
L= Lecture, Tu= Tutorial, P= Practical, T = Theory

^ This is not an exhaustive list



A handwritten signature in blue ink, likely of the Principal, Anand Pharmacy College.

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CGPA) Awarding University: Gujarat Technological  
University, Ahmedabad



Name of Program: **Pharm. D.**

Year: **II**

Course Code: **P020206TP**

Course Name: **Pharmacognosy & Phytopharmaceuticals**

Course Type: **Core**

Year of Implementation: **2024-25**

**Teaching and Examination Scheme:**

| Number of hours/<br>Week |    |   | Number of<br>credits |    |   | Total<br>credits | Evaluation Scheme (Marks) |           |    |    |                        |    | Total<br>Marks |
|--------------------------|----|---|----------------------|----|---|------------------|---------------------------|-----------|----|----|------------------------|----|----------------|
|                          |    |   |                      |    |   |                  | Sessional Exams           |           |    |    | Term End<br>Assessment |    |                |
|                          |    |   |                      |    |   |                  | Theory                    | Practical |    |    |                        |    |                |
| L                        | Tu | P | L                    | Tu | P |                  | T                         | CIE       | E  | T  | T                      | P  |                |
| 3                        | 1  | 3 | 6                    | 2  | 3 | 11               | 30                        | 10        | 20 | 30 | 70                     | 70 | 200            |

**Scope:** This subject has been introduced for the pharmacy course in order to make the student aware of medicinal uses of various naturally occurring drugs its history, sources, distribution, method of cultivation, active constituents, medicinal uses, identification tests, preservation methods, substitutes and adulterants.

**Course Outcomes (CO):**

Upon completion of the course student shall be able to

|     |                                                                                                                                       |
|-----|---------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Analyse history, scope of pharmacognosy and recognize techniques involved in the cultivation, collection, and storage of crude drugs. |
| CO2 | Summarize the microscopical and powder characteristics of crude drugs.                                                                |
| CO3 | Utilize the pharmaceutical value of carbohydrates, proteins, lipids and plant fibers containing drugs.                                |
| CO4 | Describe the utilization of natural pesticides and identification of adulteration.                                                    |
| CO5 | Identify microscopy, morphology and chemical tests for evaluating crude drugs.                                                        |
| CO6 | Perform qualitative and quantitative evaluations of crude drugs.                                                                      |

**Detailed Syllabus:**

Total Teaching hours: **90 hours**

| Sr. No. | Course Contents               | Hours  |
|---------|-------------------------------|--------|
| 1       | Introduction of Pharmacognosy | 1 hour |

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|    |                                                                                                                                                                                                                                   |          |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 2  | <b>Definition, History and scope of Pharmacognosy:</b><br>Definition, History, Scope of Pharmacognosy, and Applications of Pharmacognosy                                                                                          | 3 hours  |
| 3  | <b>Classification of crude drugs:</b><br>Alphabetical, Taxonomical, Morphological, Pharmacological, Chemical, Chemotaxonomical & Serotaxonomical classification. Cellular & Acellular Drugs.                                      | 4 hours  |
| 4  | <b>Cultivation, Collection, Processing, and Storage of Crude Drugs: Methods and Practices</b><br>Detailed Methods, Soil Management, Growth Regulators, Pest Control, and Genetic Improvement                                      | 12 hours |
| 5  | <b>Study of cell wall constituents and cell inclusions:</b> Overview of plant cell and its component, Prokaryotic and Eukaryotic cells, Living Inclusions, Non-living cell Inclusions                                             | 3 hours  |
| 6  | <b>Microscopical and powder microscopical study of crude drugs:</b><br>Rauwolfia, Ashwagandha, Ginger, Guduchi, Ephedra, Senna, Vinca, Quassia, Sandal Wood, Arjuna Bark, Cinchona bark, Clove flower, Caraway, Amla, and Linseed | 10 hours |
| 7  | <b>Study of natural pesticides:</b><br>Derris (Tuba-root), Neem, Pyrethrum, Ryania, Sabadilla                                                                                                                                     | 4 hours  |
| 8  | <b>Detailed analysis of Plant metabolites :</b><br>Introduction, Glycoside, Alkaloids, Volatile oil, Tannins, Vitamins, Hormones, Carbohydrates, Protein, and Lipids                                                              | 15 hours |
| 9  | <b>Carbohydrates and related products:</b><br>Introduction, Monosaccharides, Disaccharides, Polysaccharides, and Gums                                                                                                             | 3 hours  |
| 10 | <b>Detailed study of carbohydrates containing drugs:</b><br>Honey, Acacia, Tragacanth, Starch, Isapgol, Irish Moss, Alginic Acid, Xanthan Gum, Sterculia Gum, and Guar Gum                                                        | 9 hours  |
| 11 | <b>Lipids:</b><br>Definition, sources, method of extraction, chemistry and method of analysis                                                                                                                                     | 8 hours  |
| 12 | <b>Detailed study of oils:</b><br>Olive oil, Coconut oil, Shark liver oil, Almond oil, Arachis oil, Castor oil, Chaulmoogra oil, and Cod liver oil                                                                                | 8 hours  |
| 13 | <b>Protein:</b><br>Definition, classification, chemistry and method of analysis                                                                                                                                                   | 4 hours  |
| 14 | <b>Study of plants fibers used in surgical dressings and related products</b>                                                                                                                                                     | 4 hours  |

|    |                                                                |         |
|----|----------------------------------------------------------------|---------|
| 15 | Different methods of adulteration of crude drugs with examples | 2 hours |
|----|----------------------------------------------------------------|---------|

### Tutorials

30 Hours Tutorials will be based on the above syllabus

**Tutorial hours:**

### Practical (3 Hours/ Week, Total: 90 Hours)

**General Requirements:** Laboratory Napkin, Observation Book 150 pages, Zero brush, Needle, Blade, Match box

### List of Practicals

1. Introduction of Pharmacognosy laboratory and experiments.
2. Study of cell wall constituents and cell inclusions.
3. Macro, powder and microscopic study of Datura.
4. Macro, powder and microscopic study of Senna.
5. Macro, powder and microscopic study of Cassia Cinnamon.
6. Macro, powder and microscopic study of Cinchona.
7. Macro, powder and microscopic study of Ephedra.
8. Macro, powder and microscopic study of Quassia.
9. Macro, powder and microscopic study of Clove.
10. Macro, powder and microscopic study of Fennel.
11. Macro, powder and microscopic study of Coriander.
12. Macro, powder and microscopic study of Isapgol
13. Macro, powder and microscopic study of Nux vomica.
14. Macro, powder and microscopic study of Rauwolfia.
15. Macro, powder and microscopic study of Liquorice.
16. Macro, powder and microscopic study of Ginger.
17. Macro, powder and microscopic study of Podophyllum.
18. Determination of Iodine value.
19. Determination of Saponification value and unsaponifiable matter.
20. Determination of Ester value.
21. Determination of Acid value.
22. Chemical tests for Acacia.
23. Chemical tests for Tragacanth.
24. Chemical tests for Agar.
25. Chemical tests for Starch.
26. Chemical tests for Lipids. (Castor oil, sesame oil, shark liver oil, bees wax)



27. Chemical tests for Gelatin.
28. Chemical tests for the detection of alkaloids in plant samples using general tests.
29. To prepare a Thin Layer Chromatography (TLC) plate as per Ayurvedic Pharmacopoeia and demonstrate its use.
30. To study of Plant Sweeteners.

### Scheme of Practical Examination

|                   | Internal/ Sessional | External       |
|-------------------|---------------------|----------------|
| Identification    | 04                  | 10             |
| Synopsis          | 04                  | 10             |
| Major Experiment  | 07                  | 20             |
| Minor Experiment  | 03                  | 15             |
| Viva              | 02                  | 15             |
| <b>Max. marks</b> | <b>20</b>           | <b>70</b>      |
| <b>Duration</b>   | <b>3 hours</b>      | <b>4 hours</b> |

Note: Total sessional marks are 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance)

### Recommended Books:

1. C.K. Kokate, Purohit, Gokhale. Text book of Pharmacognosy, 56th Edition, Nirali Prakashan, Pune, 2019
2. Tyler, V.E., Brady, L.R. and Robbers, J.E., Pharmacognosy, 9th Edn., Lea and Febiger, Philadelphia, 1988.
3. Shah CS, Pharmacognosy, B.S. Shah Prakashan, 2017.
4. Mohammad Ali. Pharmacognosy, 2nd Edition, CBS Publishers & Distributors, New Delhi 2019.
5. Evans WC. Trease and Evans Pharmacognosy. 16th Edition, W.B. Saunders & Co., London, 2009.
6. T.E. Wallis, Textbook of Pharmacognosy, 5th edition, CBS Publishers & Distributors, New Delhi, 2005.
7. Pharmacognosy by M.A. Iyengar.
8. SH. Ansari, Essentials of Pharmacognosy, 4th edition, Birla publications, New Delhi, 2011
9. Biren Shah & A. K. Seth, Textbook of Pharmacognosy & Phytochemistry, 2nd edition, Elsevier Publication, New Delhi, 2010.
10. Khandelwal K. R. Practical Pharmacognosy, 26th edition, Nirali Prakashan, Pune, 2016

L= Lecture, Tu= Tutorial, P= Practical, T = Theory

^ This is not an exhaustive list



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 Awarding University: Gujarat Technological University, Ahmedabad

Name of Program: **Pharm D**

Year: **II**

Course Code: **P020207EP**

Course Name: **Meditation in Practice**

Course Type: **Elective (Value Added Course)**

Year of Implementation: **2024-25**

Total Hours: **30 hours**

**Teaching and Examination Scheme:**

| Number of hours/Week |    |   | Number of credits |    |   | Total credits | Evaluation Scheme (Marks) |   |   |           |    |    |                         |    | Total Marks |
|----------------------|----|---|-------------------|----|---|---------------|---------------------------|---|---|-----------|----|----|-------------------------|----|-------------|
|                      |    |   |                   |    |   |               | Sessional Exams           |   |   |           |    |    | End Semester Assessment |    |             |
|                      |    |   |                   |    |   |               | Theory                    |   |   | Practical |    |    |                         |    |             |
| L                    | Tu | P | L                 | Tu | P |               | CIE                       | E | T | CIE       | E  | T  | T                       | P  |             |
| -                    | -  | 1 | -                 | -  | 1 | 1             | -                         | A | - | 5         | 10 | 15 | -                       | 35 | 50          |

**Scope:**

This course offers both theoretical understanding and practical experience in meditation, guiding participants in establishing a personal practice for improved well-being.

**Course Outcomes (CO):**

Upon completion of the course student shall be able to

|     |                                                                                                                                     |
|-----|-------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand the concept, science, and benefits of Meditation to manage stress, enhance emotional regulation, and promote well-being. |
| CO2 | Able to practice meditation for enhanced self-awareness, spiritual growth and inner peace.                                          |

**Course Content**

Total Teaching hours: **30 hours**

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Unit 1</b> | <b>Understanding Meditation: Practices, Benefits, Cultural Context, Meditation Postures and Creating the Right Space</b><br><br>What is meditation? Core components of Meditation, Distinguishing meditation from relaxation, hypnosis, Common misconceptions about meditation, History and Cultural Context: Origins of meditation in ancient traditions (e.g., Buddhism, Hinduism, Taoism). Evolution of meditation practices over time. Cultural variations in meditation practices. Secularization of meditation in modern times. Types and Styles of Meditation, Benefits of Meditation<br><b>Practice session:</b><br>Posture Practices: Guided practice of different meditation postures to determine the most comfortable and effective position.<br>Body Alignment and Space Design: Guided body scan to relax, followed by creating a distraction-free meditation space. | <b>8 hours</b> |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|



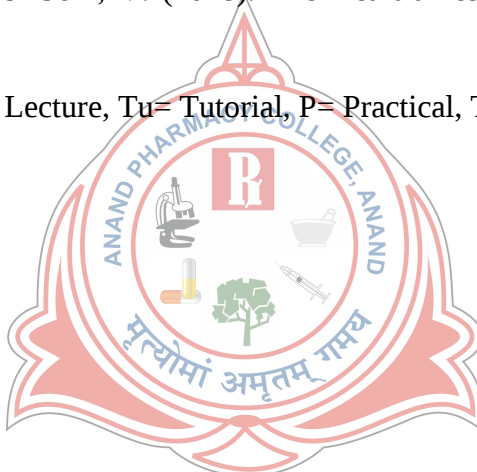
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|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|               | Meditation and Reflection: Practice meditation in the designed space, followed by group sharing and discussion on the experience.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |
| <b>Unit 2</b> | <b>The Science and Therapeutic Applications of Meditation:</b><br>Physiological and Psychological Effects of Meditation <ul style="list-style-type: none"> <li>• Impact on the autonomic nervous system (ANS) and brain structures.</li> <li>• Regulation of neurotransmitters (serotonin, dopamine, cortisol).</li> <li>• Effects on heart rate variability and inflammatory markers.</li> </ul> <b>Therapeutic Applications of Meditation</b> in Mental Health, Pain Management, Addiction Recovery, Sleep Improvement, Cognitive Enhancement, Stress Reduction, and Emotional Healing<br><b>Activity:</b><br>Review a research paper from PubMed or ScienceDirect on meditation's therapeutic effects for Presentation to summarize the methodology, key results, and therapeutic applications related to Meditation and science.                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>6 hours</b> |
| <b>Unit 3</b> | <b>Meditation and Mind Control</b><br><b>Prayer and Meditation:</b> Definition and Purpose Spiritual Benefits, Differences and Synergies<br><b>The Power of Concentration:</b> Importance of Focus, Techniques to Improve Concentration, Benefits in Daily Life, Obstacles in Meditation, Strategies to Overcome Distractions, Behavioral Techniques to Control the Mind<br><b>Practice session:</b><br>A hands-on session to practice meditation techniques, including concentration exercises.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>4 hours</b> |
| <b>Unit 4</b> | <b>Harnessing Inner Focus through Heartfulness Meditation</b><br>Introduction to Heartfulness Meditation: Definition and Purpose<br>Key Benefits of Meditation<br><b>One Centering Thought:</b> Importance of a Unifying Thought<br>Techniques for Selecting and Maintaining Focus<br><b>Being an Observer:</b> The Role of Detachment in Meditation<br>Observing Thoughts and Emotions Without Judgment<br><b>Being in Sync with Nature:</b> Aligning with Natural Rhythms and Energies<br><b>Techniques for Harmonizing with Nature During Meditation</b><br><b>Power of Thought and Releasing Negative Thoughts:</b> Understanding the Impact of Thoughts on Well-Being Techniques for Releasing Negative or Limiting Thoughts<br><b>Focus on Process vs. Outcome:</b> Emphasizing the Meditation Journey Over Results<br>Cultivating Patience and Presence<br><b>Moving Forward:</b> Using Meditation for Personal Growth, Integrating Meditation into Daily Life for Continued Progress<br><br><b>Activity:</b><br>Visiting a Natural Place for Meditation<br>Objective: To connect with the natural surroundings, enhancing inner peace and harmony through the environment.<br><br><b>Practice sessions:</b><br>Guided Meditation practices to focus on above listed topics. | <b>6 hours</b> |
| <b>Unit 5</b> | <b>Building Resilience and Ethics in Meditation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>6 hours</b> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | <p><b>Resilience: Bouncing Back After Failure:</b> Understanding Resilience and its Role in Personal Growth, Strategies to Cultivate Mental and Emotional Resilience, Learning from Failures and Maintaining Focus on the Journey</p> <p><b>Value-Based Practices and Ethics in the Profession:</b> Defining Value-Based Practices in Meditation and Professional Life, Upholding Ethics: Integrity, Compassion, and Accountability, Integrating Ethical Practices in Daily Life and Work and fostering Spiritual Growth and Inner Peace</p> <p><b>Practice sessions:</b><br/>Guided Meditation practices to focus on above listed topics.</p> |  |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

### Recommended Books^: (Latest Editions)

1. Goleman, D. (2017). The Art of Meditation: Four Classic Meditative Techniques Adapted for Modern Life. HarperCollins Publishers.
2. Patel, K. D. (2018). Simple Heartfulness Practices: For Nourishing Your Mind and Soul. Heartfulness Institute.
3. Patel, K. D. (2020). Spiritual Anatomy: Meditation, Chakras, and the Journey to the Center. Heartfulness Institute.
4. Vivekananda, S. (2016). Meditation and Its Methods. Advaita Ashrama.
5. Patel, K. D., Pollock, J., & Soni, V. (2018). The Heartfulness Way: Heart-Based Meditations for Spiritual Transformation.

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 Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm D**

Year: **II**

Course Code: **P020208EP**

Course Name: **Yoga in Practice**

Course Type: **Elective (Value Added Course)**

Year of Implementation: **2024-25**

Total Hours: **30 hours**

**Teaching and Examination Scheme:**

| Number of hours/Week |    |   | Number of credits |    |   | Total credits | Evaluation Scheme (Marks) |   |   |           |    |    |                         |    | Total Marks |
|----------------------|----|---|-------------------|----|---|---------------|---------------------------|---|---|-----------|----|----|-------------------------|----|-------------|
|                      |    |   |                   |    |   |               | Sessional Exams           |   |   |           |    |    | End Semester Assessment |    |             |
|                      |    |   |                   |    |   |               | Theory                    |   |   | Practical |    |    |                         |    |             |
| L                    | Tu | P | L                 | Tu | P |               | CIE                       | E | T | CIE       | E  | T  | T                       | P  |             |
| -                    | -  | 1 | -                 | -  | 1 | 1             | -                         | - | - | 5         | 10 | 15 | -                       | 35 | 50          |

**Scope:**

This course offers both theoretical understanding and practical experience in meditation, guiding participants in establishing a personal practice for improved well-being.

**Course Outcomes (CO):**

Upon completion of the course student shall be able to

|     |                                                                                                                                             |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Able to evaluate the Science, and benefits of Yogasana and Pranayam to manage stress, enhance emotional regulation, and promote well-being. |
| CO2 | Able to keep in practice Yogasana for enhanced self-awareness and strengthen body controls.                                                 |

**Course Content**

Total Teaching hours: **30 hours**

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Unit 1</b> | <b>Introduction to Yogasana and Meditation:</b> Origin of Yoga, History and Development of Yoga, its overall benefits, Introduction to meditation and mindfulness, Basic principles and philosophy of yoga,<br><b>Insightful Practice Sessions</b><br><b>Basic Asanas:</b> Subtle Movements (Neck, Shoulder, Wrist, Waist, Knee, Ankle), Basic standing poses (Tadasana, Vrikshasana), Seated poses (Sukhasana, Vajrasana)<br><b>Pranayam Techniques:</b> Anulom Vilom (Alternate Nostril Breathing), | <b>6 Hours</b> |
| <b>Unit 2</b> | <b>Introduction of Pranayama:</b> Concept of Prana & Ayama, Explanation and practice of Pranayama , How pranayama works on human body.<br><b>Insightful Practice Sessions</b><br><b>Intermediate Asanas:</b> Balancing poses (Garudasana, Natarajasana), Forward bends (Paschimottanasana), Twists (Ardha Matsyendrasana),<br><b>Pranayam Techniques:</b> Kapalabhati (Skull Shining Breath), Bhramari (Bee Breath)                                                                                   | <b>6 Hours</b> |

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|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Unit 3</b> | <b>Integrated Approach of Yoga therapy for the Common Ailments with Evidence research:</b> Respiratory disorders, Cardiovascular disorders, Endocrinal and Metabolic Disorder, Obstetrics and Gynecological Disorders, Menstrual disorders, Gastrointestinal disorders, Cancer, Musculo-Skeletal Disorders, Neurological Disorders: Headaches, Psychiatric disorders<br><b>Insightful Practice Sessions</b><br><b>Advanced Asanas:</b> Inversions (Sarvangasana, Halasana), Backbends (Bhujangasana, Ustrasana), Basic relaxation techniques (Savasana),<br><b>Pranayam Techniques:</b> Ujjayi (Victorious Breath), Simhasana (Lion's breath) | <b>6 Hours</b> |
| <b>Unit 4</b> | <b>Introduction to Bandhas (energy locks):</b> What is bandh?, Types of Bandha, How Bandha works on human body.<br><b>Insightful Practice Sessions</b><br><b>Sun Salutation:</b> Surya-Namaskar<br><b>Advanced Asanas:</b> Hip openers (Baddha Konasana, Upavistha Konasana), Chakrasana (wheel pose) Kandharasana (setubandhasana),<br><b>Pranayam Techniques:</b> Sitali (Cooling Breath)                                                                                                                                                                                                                                                   | <b>6 Hours</b> |
| <b>Unit 5</b> | <b>Introduction to Bhagavad Gita (B.G) :</b> The essence of life and self-realization through various yogic paths<br><b>Insightful Practice Sessions</b><br><b>Advanced Asanas:</b> Naukasana, Mandukasana, Bharadwajasana, Dhanurasana (bow pose), Matyasana (fish pose), Salabhasana (the locust pose)<br><b>Pranayam Techniques:</b> Bhastrika (inhaling and exhaling quickly)                                                                                                                                                                                                                                                             | <b>6 Hours</b> |

#### Recommended Books^: (Latest Editions)

1. Light on Yoga by B KS Iyengar
2. Prana and Pranayama by Swami Niranjanananda Saraswathi
3. Teaching Yoga: Essential Foundations and Techniques by Mark Stephens
4. The Yoga Sutras of Patanjali by Swami Satchidananda
5. The science Of Pranayama by Sri Swami Sivananda

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Awarding University: Gujarat Technological University, Ahmedabad

Name of Program: **PHARM.D**

Year: **II**

Course Code: **P020209ET**

Course Name: **Foundation of Entrepreneurship**

Course Type: **Elective (SEC - Skill Enhancement Courses)**

Year of Implementation: **2024-25**

**Teaching and Examination Scheme:**

| Number of hours/ Week |    |   | Number of credits |    |   | Total credits | Evaluation Scheme (Marks) |           |   |   |                     |   | Total Marks |
|-----------------------|----|---|-------------------|----|---|---------------|---------------------------|-----------|---|---|---------------------|---|-------------|
|                       |    |   |                   |    |   |               | Sessional Exams           |           |   |   | Term End Assessment |   |             |
|                       |    |   |                   |    |   |               | Theory                    | Practical |   |   |                     |   |             |
| L                     | Tu | P | L                 | Tu | P |               | T                         | CIE       | E | T | T                   | P |             |
| 1                     | 0  | 0 | 1                 | 0  | - | 2             | 15                        | -         | - | - | 35                  | - | 50          |

**Scope:**

This course helps students develop entrepreneurial skills, including business planning, innovation, design thinking, and ethical leadership, to successfully launch and manage startups.

**Course Outcomes (CO):**

Upon completion of the course student shall be able to

|     |                                                                                                                                                               |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Develop a comprehensive understanding of entrepreneurship, including business planning, marketing strategies, financial management, and legal considerations. |
| CO2 | Apply innovative thinking and leadership skills to create, manage, and grow a sustainable entrepreneurial venture.                                            |
| CO3 | Understand and apply business strategies like market research, financial planning, and digital marketing to create successful business models.                |
| CO4 | Foster creativity, leadership, and ethical decision-making capabilities to drive startups and innovation.                                                     |

**Detailed Syllabus: Total Teaching hours: 30 hours**

| Unit          | Topic and Subtopics                                                                                                                                                                                                                                                                                                                     | Hours           |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>Unit 1</b> | Introduction to Entrepreneurship<br>- What is Entrepreneurship?<br>- Entrepreneurial Mindset and Characteristics<br>- Types of Entrepreneurs<br>- Identifying Business Opportunities<br><b>Lecture, Interactive Sessions</b><br><b>Group discussion on successful entrepreneurs. Self-assessment quiz on traits of an entrepreneur.</b> | <b>03 Hours</b> |
| <b>Unit 2</b> | Business Planning<br>- Understanding Business Models                                                                                                                                                                                                                                                                                    | <b>04 Hours</b> |

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|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|               | <ul style="list-style-type: none"> <li>- Key Elements of a Business Plan</li> <li>- Market Research and Feasibility Analysis</li> <li>- SWOT Analysis</li> <li>- Pitching Your Business Plan</li> </ul> <b>Lecture, Case Study, Group Work</b><br><b>Create a simple business model canvas.</b><br><b>Draft business plan elements.</b><br><b>Perform SWOT analysis for a startup.</b>                                                                                                |                 |
| <b>Unit 3</b> | Marketing Fundamentals <ul style="list-style-type: none"> <li>- Introduction to Marketing for Entrepreneurs</li> <li>- Identifying Target Markets and Customers</li> <li>- Marketing Strategies and Channels</li> <li>- Branding and Positioning</li> <li>- Digital Marketing Essentials</li> </ul> <b>Lecture, Case Study, Group Work</b><br><b>Develop a marketing strategy and Develop a digital marketing campaign</b>                                                            | <b>03 Hours</b> |
| <b>Unit 4</b> | Financial Management <ul style="list-style-type: none"> <li>- Basics of Financial Management</li> <li>- Budgeting and Forecasting for New Businesses</li> <li>- Raising Capital and Funding Options</li> <li>- Financial Statements: Profit &amp; Loss, Balance Sheet</li> <li>- Financial Ratios and Business Valuation</li> </ul> <b>Lecture, Case Study, Practical Exercises Prepare a budget. Analyze financial statements. Calculate financial ratios for a sample business.</b> | <b>04 Hours</b> |
| <b>Unit 5</b> | Legal Aspects of Entrepreneurship <ul style="list-style-type: none"> <li>- Types of Business Structures (Sole Proprietorship, Partnership, LLC, etc.)</li> <li>- Legal Requirements and Licenses</li> <li>- Intellectual Property Rights and Protection</li> </ul> <b>Lecture, Research, Group Work</b><br><b>Research legal requirements for a startup. Discuss types of business structures. Case study on intellectual property rights.</b>                                        | <b>04 Hours</b> |
| <b>Unit 6</b> | Innovation and Creativity <ul style="list-style-type: none"> <li>- Importance of Innovation in Entrepreneurship</li> <li>- Creative Thinking Techniques</li> <li>- Product Development and Design Thinking</li> </ul> <b>Lecture, Brainstorming Sessions</b><br><b>Group brainstorming on innovative business ideas. Creative exercises like mind mapping.</b>                                                                                                                        | <b>04 Hours</b> |
| <b>Unit 7</b> | Business Ethics <ul style="list-style-type: none"> <li>- Ethical Decision Making for Entrepreneurs</li> <li>- Social Responsibility and Sustainable Business Practices</li> </ul> <b>Lecture, Case Study Discussion Discuss ethical dilemmas faced by entrepreneurs. Case study on ethical business practices.</b>                                                                                                                                                                    | <b>04 Hours</b> |
| <b>Unit 8</b> | Leadership and Team Management <ul style="list-style-type: none"> <li>- Leadership Styles for Entrepreneurs</li> <li>- Team Building and Management</li> </ul>                                                                                                                                                                                                                                                                                                                        | <b>04 Hours</b> |

|  |                                                                                                                                              |  |
|--|----------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | - Conflict Resolution<br><b>Lecture, Role-Playing, Reflection, Reflect on leadership styles, Role-play conflict resolution within teams.</b> |  |
|--|----------------------------------------------------------------------------------------------------------------------------------------------|--|

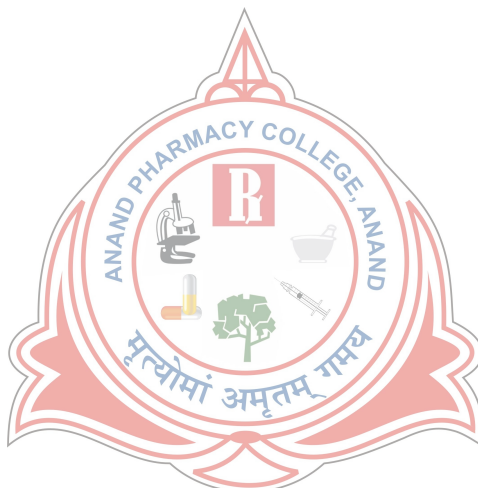
### Recommended Books^: (Latest Editions)

1. Thiel, P. (2014). Zero to One: Notes on Startups, or How to Build the Future. Crown Business.
2. Ries, E. (2011). The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses. Crown Business.
3. Rao, C. B. (2015). India as Global Start-up Hub: Mission with Passion. C. B. Rao.
4. Drucker, P. F. (1985). Innovation and Entrepreneurship: Practice and Principles. Harper & Row.
5. Christensen, C. M. (2003). The Innovator's Solution: Creating and Sustaining Successful Growth. Harvard Business Review Press.

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Awarding University: Gujarat Technological University, Ahmedabad

Name of Program: **PHARM D**

Year: **II**

Course Code: **P020210ET**

Course Name: **Innovation and Creative Thinking**

Course Type: **Elective (SEC - Skill Enhancement Courses)**

Year of Implementation: **2024-25**

**Teaching and Examination Scheme:**

| Number of hours/ Week |    |   | Number of credits |    |   | Total credits | Evaluation Scheme (Marks) |           |   |   |                     |   | Total Marks |
|-----------------------|----|---|-------------------|----|---|---------------|---------------------------|-----------|---|---|---------------------|---|-------------|
|                       |    |   |                   |    |   |               | Sessional Exams           |           |   |   | Term End Assessment |   |             |
|                       |    |   |                   |    |   |               | Theory                    | Practical |   |   |                     |   |             |
| L                     | Tu | P | L                 | Tu | P |               | T                         | CIE       | E | T | T                   | P |             |
| 1                     | 0  | 0 | 1                 | 0  | - | 2             | 15                        | -         | - | - | 35                  | - | 50          |

**Scope:**

This course offers both theoretical understanding and practical experience problem-solving approach by integrating creativity, innovation, collaboration and prototyping, develop essential 21st century skills and be able to run design thinking projects.

**Course Outcomes (CO):**

Upon completion of the course student shall be able to

|     |                                                                                                                    |
|-----|--------------------------------------------------------------------------------------------------------------------|
| CO1 | Understand and apply creativity and innovation techniques to solve complex problems using design thinking          |
| CO2 | Utilize the design thinking process to develop user-centered solutions through ideation, prototyping, and testing. |
| CO3 | Implement creative problem-solving techniques and rapid prototyping methods to enhance innovation.                 |
| CO4 | Effectively pitch innovative ideas using storytelling and communication strategies.                                |

**Detailed Syllabus: Total Teaching hours: 30 hours**

| Unit          | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Hours           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>Unit 1</b> | <b>Introduction to Creativity &amp; Innovation</b> <ul style="list-style-type: none"> <li>Definition of Creativity &amp; Innovation</li> <li>Myths vs. Reality of Creativity</li> <li>Characteristics of Creative Thinkers</li> <li>The Role of Creativity in Problem-Solving</li> <li>Types of Innovation (Incremental, Disruptive &amp; Radical)</li> </ul> <b>Activity:</b> Creative Icebreaker – "Think Outside the Box" Challenge<br><b>Report Task:</b> Identify a real-world problem related to health care or any and | <b>04 Hours</b> |



|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|               | describe how creativity could solve it.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                 |
| <b>Unit 2</b> | <b>The Design Thinking Process</b> <ul style="list-style-type: none"> <li>• Introduction to Design Thinking – Overview of human-centered design, its importance, and key characteristics with real-world case studies.</li> <li>• Empathize – Understanding User Needs (1 Hour) – Techniques like interviews and observations to identify user pain points and develop personas.</li> <li>• Define – Framing the Problem – Converting insights into structured problem statements using methods like "How Might We?" and the 5 Whys.</li> <li>• Ideate – Generating Solutions (1 Hour) – Brainstorming, mind mapping, and rapid idea generation techniques like Crazy 8s for creative solutions.</li> <li>• Prototype &amp; Test – Creating low/high-fidelity prototypes, gathering user feedback, and refining solutions through iteration and testing.</li> </ul> <b>Activities &amp; Report Tasks</b><br>Empathize & Define: Conduct a market research, field work, collect data and Create a user persona, identify pain points, and frame a problem statement using "How Might We?" (Report: Persona details & problem statement).<br>Ideate, Prototype & Test: Brainstorm ideas (Crazy 8s), develop a low-fidelity prototype, gather peer feedback, and refine the solution (Report: Top 3 ideas, prototype images, feedback summary). | <b>06 Hours</b> |
| <b>Unit 3</b> | <b>Tools &amp; Techniques for Creative Thinking</b> <ul style="list-style-type: none"> <li>• <b>Introduction to Creative Thinking:</b> Overview of creative techniques, 6 Thinking Hats and their role in problem-solving.</li> <li>• <b>SCAMPER Technique:</b> Apply the steps (Substitute, Combine, Adapt, Modify, Put to Another Use, Eliminate, Reverse) to innovate an everyday object (<b>Report:</b> Propose an improved version).</li> <li>• <b>AI &amp; Technology in Innovation:</b> Explore how AI transforms creativity in product design, drug discovery, and more (<b>Report:</b> Analyze an AI-driven innovation).</li> </ul> <b>Activity – Reverse Engineering Exercise: Deconstruct and redesign an existing product for improvement (Report: Document modifications and reasoning).</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>04 Hours</b> |
| <b>Unit 4</b> | <b>Prototyping and Testing Ideas for Innovation</b> <ul style="list-style-type: none"> <li>• Understanding the Value of Prototyping,</li> <li>• Explore low-fidelity (sketches, paper models) and high-fidelity (functional models, digital interfaces) prototypes.</li> <li>• Testing Prototypes with Real Users:</li> <li>• Iterative Process and Feedback:</li> <li>• Rapid Prototyping Techniques: Learn fast methods like 3D printing, wireframing, and simulations for quick prototype development.</li> <li>• Evaluating Prototype Effectiveness:</li> </ul> <b>Activity:</b> Create a simple prototype and test it with real users, gathering feedback on functionality and design. Refine the prototype based on user input.<br><b>Report Task:</b> Write a report describing your prototype, user feedback, and how                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>06 Hours</b> |

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                 |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|               | you will iterate to improve it, evaluating its effectiveness in solving the problem.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |
| <b>Unit 5</b> | <p><b>Scaling and Implementing Innovations</b></p> <ul style="list-style-type: none"> <li>Analyze the market potential of your innovation and develop a clear business model for delivery and monetization.</li> <li>Manage resources effectively, including time, finances, and human capital. Identify barriers to implementation and devise strategies to overcome challenges. Establish KPIs to measure the impact and success of your innovation in the market.</li> </ul> <p>Activity:<br/>Conduct a market analysis for your innovation, identifying potential competitors and customer needs. Develop a basic business model and outline key resources required for scaling.</p> <p>Report Task:<br/>Write a report summarizing the market analysis, business model, resource management plan, potential barriers, and KPIs to track the innovation's success.</p> | <b>05 Hours</b> |
| <b>Unit 6</b> | <p><b>Pitching &amp; Storytelling for Innovation</b></p> <p>Basics of Effective Communication: Learn how to speak clearly, gain trust, and connect with emotions.</p> <p>Storytelling Techniques: Create a strong story with a clear problem, solution, and impact, using visuals to engage.</p> <p><b>Activity: 3-Minute Elevator Pitch Practice</b></p> <p>Crafting and delivering a concise pitch within 3 minutes</p> <p>Focus on key value propositions and audience connection.</p>                                                                                                                                                                                                                                                                                                                                                                                  | <b>05 Hours</b> |

#### Recommended Books^: (Latest Editions)

1. Innovation and Entrepreneurship" by Dr. R.A. Mashelkar (2006)
2. The Art of Innovation" by Anil K. Gupta & Mohd. Zahid (2017)
3. The Design Thinking Toolbox: A Guide to Mastering the Most Popular and Valuable Innovation Methods by Michael Lewrick, Patrick Link, and Larry Leifer (2020)
4. "The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses" by Eric Ries (2011)

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Awarding University: Gujarat Technological University, Ahmedabad

Name of Program: **PHARM D**

Year: **II**

Course Code: **P020211ET**

Course Name: **Cyber Security**

Course Type: **Elective (Multidisciplinary Course)**

Year of Implementation: **2024-25**

**Teaching and Examination Scheme:**

| Number of hours/ Week |    |   | Number of credits |    |   | Total credits | Evaluation Scheme (Marks) |           |   |   |                     |   | Total Marks |
|-----------------------|----|---|-------------------|----|---|---------------|---------------------------|-----------|---|---|---------------------|---|-------------|
|                       |    |   |                   |    |   |               | Sessional Exams           |           |   |   | Term End Assessment |   |             |
|                       |    |   |                   |    |   |               | Theory                    | Practical |   |   |                     |   |             |
| L                     | Tu | P | L                 | Tu | P |               | T                         | CIE       | E | T | T                   | P |             |
| 1                     | 0  | 0 | 0                 | 0  | 0 | 2             | 15                        | -         | - | - | 35                  | - | 50          |

**Scope:**

The Cyber Security Law syllabus covers legal frameworks, cybercrime laws, data protection, and privacy regulations. The syllabus explores the fundamentals of cyber security in the pharmaceutical industry, covering threats like phishing, ransomware, and data theft. It examines healthcare cyber laws, risk management, digital forensics, and securing digital health systems. Additionally, it delves into ethical hacking, compliance standards, and future cybersecurity trends, including AI, block chain, and big data security in pharma.

**Course Outcomes (CO):**

Upon completion of the course student shall be able to

|     |                                                                                    |
|-----|------------------------------------------------------------------------------------|
| CO1 | Understand the fundamentals of cyber, cyber security, and its laws.                |
| CO2 | Know the legal framework of Cyber Laws, IT Act, and data protection.               |
| CO3 | Analyze types of cybercrimes, remedies, and landmark case laws.                    |
| CO4 | Apply cybersecurity practices, ethical hacking, and forensic tools for prevention. |

**Detailed Syllabus: Total Teaching hours: 30 hours**

|               |                                                                                                                                                                                                                                                                                                                                                              |                 |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>Unit 1</b> | <b>Fundamentals of Cyber (Introduction to Cyberspace &amp; Cybersecurity)</b><br>What is Cyberspace? Basics of the Internet & Digital World<br>Introduction to Cyber Threats (Hacking, Phishing, Malware, Ransomware)<br>Data Privacy & Protection and Its Importance<br>Digital Footprint & Online Identity<br>Cyber Ethics & Responsible Use of Technology | <b>10 Hours</b> |
| <b>Unit 2</b> | <b>Laws of Cyber Laws (Legal Framework &amp; Important Acts)</b><br>Introduction to Cyber Law – Meaning, Need & Scope<br>Information Technology (IT) Act, 2000 – Key Provisions<br>Data Protection Laws – National & International Perspectives                                                                                                              | <b>05 Hours</b> |

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|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                 |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|               | Cyber Contracts & Digital Signatures – Legal Validity<br>Regulatory Authorities (CERT-In, IT Ministry, RBI Guidelines)                                                                                                                                                                                                                                                                                                                                 |                 |
| <b>Unit 3</b> | <b>Cybercrimes, Remedies &amp; Procedure (Legal Rights &amp; Actions Available)</b><br><b>Types of Cybercrimes:</b><br>Cyber Fraud (Online Banking Fraud, Fake E-commerce)<br>Identity Theft & Data Breaches<br>Cyberbullying & Harassment<br>Intellectual Property Violations (Piracy, Plagiarism)<br><b>Legal Remedies Available:</b><br>How to Report a Cybercrime?<br>Police Complaint, FIR, Cyber Cells<br>IT Act & IPC Provisions for Punishment | <b>10 Hours</b> |
| <b>Unit 4</b> | <b>Case Laws &amp; Security Practices (Real Cases &amp; Cyber Safety Tips)</b><br>Landmark Cyber Crime Cases in India & Worldwide<br>Prevention Strategies – How to Stay Safe Online<br>Cybersecurity Measures – Strong Passwords, Encryption, VPN<br>Ethical Hacking & Role of Cyber Forensics<br>Future Trends – AI, Blockchain, Cyberwarfare                                                                                                        | <b>05 Hours</b> |

#### Recommended Books^: (Latest Editions)

1. Mishra Dr. J. P.; An Introduction to CYBER LAWS, Central Law Publications.
2. Viswanathan Suresh T.; The Indian Cyber Law with The Information Technology Act, 2000, Bharat Law House Pvt Ltd, New Delhi.
3. Vidya C.; Cyber Jurisdiction A Legal Vision, The Icfai University Press.
4. Mishra Dr. J.P.; An Introduction to Cyber Law, Central Law Publications, Allahabad.
5. Varma Dr. Amita; Cyber Crime & Law, Central Law Publications, Allahabad.
6. Deshpande Bhagyashree A.; Text Book on Cyber Law, Central Law Publications, Allahabad.
7. Fatima Talat; Cyber Crimes, Eastern Book Company.

#### ONLINE RESOURCES:

1. CERT-In Reports ([www.cert-in.org.in](http://www.cert-in.org.in)) – Government of India's cyber incident updates.
2. Interpol Cybercrime Resources ([www.interpol.int](http://www.interpol.int)) – Case studies and cyber law enforcement strategies.
3. Stanford Cyber Policy Center (<https://cyber.fsi.stanford.edu/>) – Research on cyber law and governance.
4. Cyber Crime Portal -<https://cybercrime.gov.in/>
5. Cyber Crime Cell Gujarat - <https://gujaratcybercrime.org/eng/guide.html>

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(Approved by PCI, NAAC Accredited – A+ Grade, 3.38 CGPA)  
Awarding University: Gujarat Technological University, Ahmedabad

Name of Program: **Pharm D**

Year: **II**

Course Code: **P020212ET**

Course Name: **Accounting financial management**

Course Type: **Elective (MDS – Multidisciplinary Elective)**

Year of Implementation: **2024-25**

**Teaching and Examination Scheme:**

| Number of hours/ Week |    |   | Number of credits |    |   | Total credits | Evaluation Scheme (Marks) |           |   |   |                     |   | Total Marks |
|-----------------------|----|---|-------------------|----|---|---------------|---------------------------|-----------|---|---|---------------------|---|-------------|
|                       |    |   |                   |    |   |               | Sessional Exams           |           |   |   | Term End Assessment |   |             |
|                       |    |   |                   |    |   |               | Theory                    | Practical |   |   |                     |   |             |
| L                     | Tu | P | L                 | Tu | P |               | T                         | CIE       | E | T | T                   | P |             |
| 1                     | 0  | 0 | 0                 | 0  | 1 | 2             | 15                        | -         | - | - | 35                  | - | 50          |

**Scope:**

This course introduces fundamental accounting principles, progressing from basic knowledge acquisition to higher-order thinking skills. Students will remember key accounting concepts, principles, and processes. They will understand bookkeeping, journal entries, and financial statements. Through practice, students will apply accounting techniques to prepare ledgers, trial balances, and bank reconciliation statements. They will analyze financial records, identifying discrepancies and their causes. By evaluating financial data, students will assess financial statements and management approaches. Finally, students will create accurate final accounts and financial reports, demonstrating competency in financial decision-making and the role of financial management in business operations.

**Course Outcomes (CO):**

Upon completion of the course student shall be able to

|     |                                                                                                                                                                                   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | To describe the objectives, meaning, and principles of accounting, along with its various branches and processes.                                                                 |
| CO2 | To examine and interpret final accounts of a sole trader, including the Trading Account, Profit & Loss Account, and Balance Sheet, while considering adjustments and limitations. |
| CO3 | To assess the scope and functional areas of financial management, along with the role of a finance manager in making strategic financial decisions.                               |
| CO4 | To demonstrate the process of recording financial transactions in journals, cash books, ledgers, and trial balances, and prepare a bank reconciliation statement.                 |

**Detailed Syllabus: Total Teaching hours: 30 hours**

| Unit | Topics                                                                                       | Hours |
|------|----------------------------------------------------------------------------------------------|-------|
| 1    | <b>Introduction to Accounting:</b> Objectives, meaning of accounting, accounting principles, | 4 hr  |

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|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
|   | branches of accounting, accounting process.                                                                                                                                                                                                                                                                         |      |
| 2 | <b>Book-keeping, Journal, cash book-I:</b> Objectives, Meaning of Book-keeping, Objective of Book-keeping, Utility of Book-keeping, Book-keeping and Accountancy, Classification of Accounts, Rules of Debit & Credit, Journal, Cash Book, Petty Cash Book, Three Column Cash Book.                                 | 6 hr |
| 3 | <b>Bank reconciliation statement:</b> Objectives, Meaning, Reasons for differences in Bank balance of Cash Book with, Pass Book, Prepares of Bank Reconciliation Statement, Chart for solving the problems, Specimen of Bank Reconciliation Statement, Bank Overdraft, Importance of Bank Reconciliation Statement. | 6 hr |
| 4 | <b>Ledger and trial balance:</b> Objectives, Meaning, how to open an Account in the ledger, Posting, Balance and Balancing of Accounts, Meaning of Balances, Trial Balance. Approaches of financial management.                                                                                                     | 6 hr |
| 5 | <b>Final accounts of a sole trader:</b> Objectives, Introduction, Trading Account, Profit & Loss Account, Balance Sheet, Classification of Assets, Classification of Liabilities, Limitations of Balance Sheet, Adjustments.                                                                                        | 6 hr |
| 6 | <b>Financial management:</b> Objectives, Meaning, Scope of Financial Management, Role of Finance Manager, Functional areas of Financial Management.                                                                                                                                                                 | 6 hr |

#### Recommended Books^: (Latest Editions)

1. "Book Keeping and Accountancy" Choudhari, Chopde.
2. "Cost Accounting": Choudhari, Chopde.
3. "Financial Management" Text and Problems: M. Y. Khan, P. K. Jain.
4. "Financial Management Theory & Practice" Prasanna Chandra, Tata McGraw Hill.
5. Managerial Economics & Financial Analysis, Siddiqui S. A. Siddiqui A.S. New Age.

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**Managed by Shri Ramkrishna Seva Mandal**

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Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **PHARM D**

Year: **II**

Course Code: **P020213ET**

Course Name: **Life with Bhagvad Gita**

Course Type: **Elective (Multidisciplinary Course)**

Year of Implementation: **2024-25**

**Teaching and Examination Scheme:**

| Number of hours/ Week |    |   | Number of credits |    |   | Total credits | Evaluation Scheme (Marks) |           |   |   |                     |   | Total Marks |
|-----------------------|----|---|-------------------|----|---|---------------|---------------------------|-----------|---|---|---------------------|---|-------------|
|                       |    |   |                   |    |   |               | Sessional Exams           |           |   |   | Term End Assessment |   |             |
|                       |    |   |                   |    |   |               | Theory                    | Practical |   |   |                     |   |             |
| L                     | Tu | P | L                 | Tu | P |               | T                         | CIE       | E | T | T                   | P |             |
| 1                     | 0  | 0 | 0                 | 0  | 1 | 2             | 15                        | -         | - | - | 35                  | - | 50          |

**Scope:**

This course is designed to emphasize the significance of the Bhagavad Gita in daily life, encouraging learners to integrate its teachings into their personal and professional routines. It aims to provide insights into the timeless wisdom of the Gita, and fostering emotional resilience. Students will gain a deeper understanding of the Gita's principles, empowering them to lead more balanced, purposeful, and harmonious lives.

**Course Outcomes (CO):**

Upon completion of the course, student shall be able to

|     |                                                                         |
|-----|-------------------------------------------------------------------------|
| CO1 | To introduce basic principles, History and Background of Bhagavad-Gita. |
| CO2 | To understand the self and Sthit Prajna as an ideal person.             |
| CO3 | Learning the concept of Arjun Vishad.                                   |
| CO4 | To understand the philosophy of Karma, Akarma and Vikarma.              |

**Detailed Syllabus:**

Total Teaching hours: **30 hours**

|               |                                                                                                                                                                                                                                                              |                |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Unit 1</b> | Introduction to Bhagvad Gita: An Overview of the History and Background; Exploring the Gita's Influence through Various Commentaries; Role and Necessity of Arjunavishad Yoga.                                                                               | <b>7 hours</b> |
| <b>Unit 2</b> | The Concept of Sthitaprajna in the Gita. Exploring the Nature of the Self and the Supreme, Along with the Attributes of the Individual Soul. The Concept of the Gita's Yajyabhavana; Kshetr-Kshetragya Vichar; Nirguna-Saguna Vichar; Concept of Trigunatit. | <b>8 hours</b> |
| <b>Unit 3</b> | The Concept of Karma and its Various Types; Sakama Karma and Nishkama Karma Yoga. Understanding the Concepts of Karma, Akarma, and Vikarma; The Modern Day Relevance of KarmaYoga; Karmyogi as the Ideal Person in the Bhagavad Gita.                        | <b>8 hours</b> |

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|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Unit 4</b> | The Concept of Swadharma; Daivi-Aasuri Sampad, Concept of Avtarvad; Yogabhrasht's Gati, The Role and Importance of Moksha; Understanding Diverse Paths to Liberation: Karma Yoga, Jnana Yoga, and Bhakti Yoga. Moksha (Liberation) as the Ultimate Goal of Man's Life. | <b>7 hours</b> |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|

#### Recommended Books^: (Latest Editions)

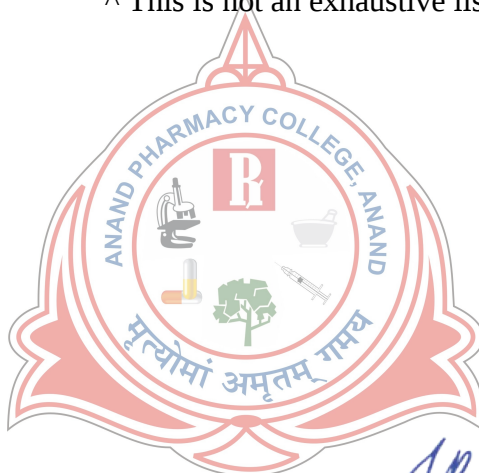
1. Shrimad Bhagavad Gita, C.L. Shastri, P.C. Dave, G. S. Shah, SarsvatiPustakBhandar.
2. Shrimad Bhagavad Gita, Dr. Suhas D. Zala, SarsvatiPustakBhandar, Ahmedabad.
3. Shrimad Bhagavad Gita, Shankar BhashySahit, Bhikshu Akhand anandsastusahityavardhakkaryalay Ahmedabad, And Mumbai
4. Shrimad Bhagavad Gita, C.L. Shastri, P.C. Dave, Akhil hind Prakashan, Ahmedabad.
5. Gita Manthan, Kishorlal D. Masharuvala, NavjivanPrakashan, mandair, Ahmedabad.

#### On-line Resources

1. <https://archive.org>
2. <https://bhartiamahajan.blogspot.com/2017/10/blog-post.html?m=1>
3. <https://archive.org/details/QBHIbhagavata-gita-with-shanakaracharya-bhashya-gita-presss-gorakhpur>

L= Lecture, Tu= Tutorial, P= Practical, T = Theory

^ This is not an exhaustive list



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 Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm. D**

Year: **II**

Course Code: **P020214ET**

Course Name: **Proficiency in Computer Skills**

Course Type: **Multidisciplinary Elective**

Year of Implementation: **2024-25**

**Teaching and Examination Scheme:**

| Number of hours/<br>Week |    |   | Number<br>of<br>Credits |    |   | Total<br>credits | Evaluation Scheme (Marks) |    |    |           |   |   |                        |   | Total<br>Marks |
|--------------------------|----|---|-------------------------|----|---|------------------|---------------------------|----|----|-----------|---|---|------------------------|---|----------------|
|                          |    |   |                         |    |   |                  | Sessional Exams           |    |    |           |   |   | Term End<br>Assessment |   |                |
|                          |    |   |                         |    |   |                  | Theory                    |    |    | Practical |   |   |                        |   |                |
| L                        | Tu | P | L                       | Tu | P |                  | CIE                       | E  | T  | CIE       | E | T | T                      | P |                |
| 1                        | 0  | 0 | 2                       | 0  | 0 | 2                | 5                         | 10 | 15 | 0         | 0 | 0 | 35                     | 0 | 50             |

**Scope:**

This course equips students with advanced computer skills for data management, analysis, visualization, and application in the pharmaceutical field, preparing them for effective use of technology in pharmacy practices.

**Course Outcomes (CO):**

Upon completion of the course, student shall be able to

|     |                                                                                                                          |
|-----|--------------------------------------------------------------------------------------------------------------------------|
| CO1 | Apply MS Office, Canva, and image tools for efficient document, presentation, and design creation.                       |
| CO2 | Utilize Google Workspace apps for effective collaboration, data handling, presentations, and professional communication. |
| CO3 | Demonstrate Python basics, AI tools, and IoT integration for innovative computing and applications.                      |
| CO4 | Analyze cybersecurity threats and implement prevention strategies through practical approaches and case studies.         |

**Detailed Syllabus:**

Total Teaching hours: **30 hours**

| Unit          | Topics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Hours          |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Unit 1</b> | <b>MS Word</b> – Interface & Navigation, Creating & Saving Documents, Text Formatting, Paragraph Styles, Page Layout, Margins, Headers & Footers, Tables & Charts, Mail Merge, References (Table of Contents, Citations), Reviewing Tools (Track Changes, Comments).<br><b>MS Excel</b> – Interface & Navigation, Data Entry, Formatting, and Sorting, Basic Formulas & Functions (SUM, AVERAGE, IF), Conditional Formatting, Advanced Functions (VLOOKUP, HLOOKUP, COUNTIF), Pivot Tables, Data Validation & Drop-down Lists, Creating Charts & Graphs.<br><b>MS PowerPoint</b> – Slide Design & Layouts, Adding Text, Images, & Videos, Transitions & Animations, Slide Master & Templates, SmartArt & Info graphics, Embedding Charts & Tables, Presenter View & Custom Slide Show, Exporting & | <b>8 Hours</b> |

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|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|               | <p>Sharing Presentations.</p> <p><b>Canva</b> – Canva Interface &amp; Templates, Customizing Text, Images, and Elements, Using Brand Kit &amp; Color Themes, Designing Posters, Flyers, and Social Media Posts, Presentations in Canva, Video &amp; Animation Features, Collaboration &amp; Sharing, Exporting &amp; Printing Designs.</p> <p><b>Image Processing:</b> Resize, Compress, merge the Images using MS Paint and picture Manager.</p> |                |
| <b>Unit 2</b> | <p>Introduction to Google Apps, Google Drive &amp; File Management, Google Docs &amp; Collaboration, Google Sheets &amp; Data Handling, Google Slides &amp; Presentations, Gmail &amp; Google Calendar, Google Meet &amp; Google Chat, Google Sites &amp; Google Forms.</p>                                                                                                                                                                       | <b>8 Hours</b> |
| <b>Unit 3</b> | <p>Python programming basics, AI tools for work &amp; study, AI-powered content creation, AI-based creative tools, AI-powered marketing &amp; branding, Basics of IoT &amp; AI integration, Cloud Computing, AI &amp; IoT working together, AI &amp; IoT career trends.</p>                                                                                                                                                                       | <b>8 Hours</b> |
| <b>Unit 4</b> | <p>Introduction to Cyber security Threats, Understanding Viruses, Understanding Worms, Data Theft and Its Impact, Prevention and, Mitigation Strategies, Case Studies and Practical Solutions.</p>                                                                                                                                                                                                                                                | <b>6 Hours</b> |

#### **Recommended Books^: (Latest Editions)**

1. "Microsoft Office 365: In Practice" by Randy Nordell – A comprehensive guide covering advanced features of Word, Excel, PowerPoint, and more.
2. "Microsoft Office 365 All-in-One For Dummies" by Peter Weverka – A user-friendly book that dives into advanced MS Office functions and tips.
3. "Google Apps Made Easy: Learn to Work in the Cloud" by James Bernstein – A beginner-to advanced guide covering Gmail, Google Drive, Docs, Sheets, and more.
4. "The Complete Guide to Google Workspace" by Scott La Counte – A practical book on using Google Apps for productivity and collaboration.
5. "Python Crash Course" by Eric Matthes – A beginner-friendly guide to Python programming basics.
6. "Artificial Intelligence and IoT: Smart Systems and Applications" by Lalit Mohan Goyal – Covers AI, IoT integration, and career trends in these fields.
7. "Cybersecurity Essentials" by Charles J. Brooks – Covers fundamental cybersecurity threats, viruses, worms, data theft, and prevention strategies.
8. "The Art of Invisibility" by Kevin Mitnick – Explores real-world case studies, data theft risks, and practical cybersecurity solutions.

#### **Reference Sites:**

1. Microsoft Learn – <https://learn.microsoft.com/en-us/training/office> (Official tutorials and certifications from Microsoft)
2. Excel Campus – <https://www.excelcampus.com/> (Advanced Excel tutorials and automation techniques)
3. Google Workspace Learning Center – <https://support.google.com/a/users> (Official Google tutorials for all apps)
4. GCF Global - Google Tutorials – <https://edu.gcfglobal.org/en/> (Free step-by-step guides on Google Docs, Sheets, and more)
5. Google AI Blog – <https://ai.googleblog.com/> (Latest advancements in AI tools and AI-powered content creation)
6. IBM Cloud Learning Hub – <https://www.ibm.com/cloud/learn> (Comprehensive resources on cloud

computing and AI-IoT integration)

7. Cybrary – <https://www.cybrary.it/> (Free and paid courses on cybersecurity threats, prevention, and case studies)
8. CISA (Cybersecurity & Infrastructure Security Agency) – <https://www.cisa.gov/> (Official U.S. government site with cybersecurity alerts, best practices, and mitigation strategies)

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