SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

Cos and Pos and PSOs of Programs offered by the institution

PROGRAM OUTCOMES (POs)

PROGRAM OUTCOMES (POs)	
PO 1	**Pharmacy Knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.
PO 2	**Planning Abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
PO 3	**Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
PO 4	**Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
PO 5	**Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well-being.
PO 6	**Professional Identity:** Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
PO 7	**Pharmaceutical Ethics:**Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
PO 8	**Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
PO 9	**The Pharmacist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
PO 10	**Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 11	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

PROGRAM SPECIFIC OUTCOMES (PSOs)	
B. PHARMACY	
PSO1	To foster a research environment in various multidisciplinary aspects of pharmaceutical sciences involved in drug development and end product optimization.
PSO2	To accentuate the role of a pharmacist in the health care system and community well-being
PHARM. D. & PHARM. D. (PB)	
PSO1	Anticipate the patient's needs; participate in the creation of individualized disease management and prevention plans including patients' self-management and behavior changes.
PSO2	Knowledge to participate with inter professional health care team members in the management of health promotions for all patients by providing pharmaceutical care (Includes Medication therapy management/Therapeutic Drug monitoring)
PSO3	Graduates can apply their expertise to recognize possible adverse drug interaction or any side effects can also counsel the patients to comply with the prescribed treatment regimen.
PSO4	Knowledge to formulate evidence-based health care plans, assessments and recommendations
PSO5	Comphrehend the role to provide health care services to patients and families with the aim of preventlng related problems and tomaintain the overall health.
PSO6	Assimilate and enhance the quality of care and service to patients by optimizing the ability to use critical analysis and problem-solving skills for better patient outcomes.
M. Pharm- Pharmaceutics	
PSO 1	To whirl a new chemical entity into a formulation that can be used safely and effectively by the patients.
PSO 2	To expertise in technical skills and gain knowledge in bioavailability and bioequivalence studies
PSO 3	To develop modest nanotechnology skill in the field of pharmaceutical research.
PSO 4	To impart knowledge and skill development on designing of dosage forms as per GMP guielines
PSO 5	Establishing potentiality in multidisciplinary chore for betterment in quality of drug delivery systems.
PSO 6	Acquire core knowledge in computer simulations and problem analysis as per regulatory requirements for the development of dosage forms.
M. Pharmacy (Pharmaceutical Analysis)	
PSO 1	To learn the advanced analytical techniques for the determination of various drugs I single and combination dosage forms.
PSO 2	To operate, control, analyze and evaluate chemical substances, cosmetic products and finished products using hyphenated techniques.
PSO 3	To carry out the validation of manufacturing processes and apply the knowledge of validation to instruments and equipments.
PSO 4	To design a system, component or process to meet the desired needs within realistic constraints such as economic, environmental, sustainability social, ethical, health,

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

	safety and manufacturability for humans.
PSO 5	To understand the responsibilities of QA & QC departments like cGMP aspects, scope of quality certifications and importance of documentation.
PSO 6	To promote the development of skilled human resource in Pharmaceutical Sciences for propagation of quality education with right professional and ethical attitude, good communication skills, right mental attitude in a multidisciplinary Pharmaceutical Sciences area.
M. Pharmacy (Pharmacology)	
PSO 1	Deal with various advanced instrumental techniques for identification, characterization and quantification of drugs.
PSO 2	Demonstrate basic knowledge in the field of pharmacology and to impart recent advances in the drugs used for the treatment of various diseases. In addition, pharmacologist will understand the concepts of drug action and mechanisms involved.
PSO 3	Knowledge on preclinical evaluation of drugs and recent experimental techniques in the drug discovery and development.
PSO 4	Pharmacologist will appraise the regulations and ethical requirement for the usage of experimental animals.
PSO 5	Pharmacologist will have fundamental knowledge on the structure and functions of cellular components and interaction of these components with drugs. This information will further help the student to apply the knowledge in drug discovery process.
PSO 6	Pharmacologist will easily demonstrate the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases to the society.
PSO 7	Impart knowledge on the preclinical safety and toxicological evaluation of drug & new chemical entity.
PSO 8	Pharmacologist will make the student competent in drug discovery process.
PSO 9	A talent pool would be created by involving students in research projects and to make students undertake research projects under faculty guidance for publication. PSO.10 Promote ambitious desire to undertake higher studies and career growth.
M. Pharmacy (Pharmaceutical Regulatory Affairs)	
PSO 1	Gain the respective background information, regulatory framework and necessary resources to understand how pharmaceutical products are regulated in different countries and how regulatory affairs professionals can help organizations navigate through regulatory obstacles.
PSO 2	Apply the relevant regulations, policies, guidance documents as well as important initiatives with respect to pharmaceuticals, biologicals, natural health products and various other therapeutic products.
PSO 3	The course also helps students to discuss on how regulatory affairs professionals add value to various organizations and opportunities available within the industry.
PSO 4	Students able to develop and enhance communication skills, including verbal, nonverbal and written which is essential in professional environments of regulatory affairs. Students learn proper writing, editing and comprehension strategies.
PSO 5	Students gain knowledge of project management processes and their application to regulatory submissions. This course equips students with skills necessary for global

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510, T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

	regulatory submissions, from selection of submission type to planning and preparing such submissions for review by respective regulatory agencies.
PSO 6	Students become familiar with the legislative framework and regulations that guide the selection and designation of medical products globally. Case studies are used to provide practical experience in applying international regulations and legislations, including EU and US. Students are also introduced to softwares commonly used in the regulatory affairs field.

SREE DATTHA INSTITUTE OF PHARMACY Sheriguda

JNTUH COLLEGE CODE: U2 EAMCET CODE: SDIP

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

Sl. No.	Course code	Course name	Course outcome statement
			B. PHARMACY
B. Pharmacy I year I Semester			
1	**PS101**	Human anatomy and Physiology-I (Theory)	Upon completion of the course the student shall be able to **CO.101** Illustrate the gross morphology, structure and functions of various organs of the human body at cell and tissue levels. **CO.102** Identify the structures and functions of skin. **CO.103** Discuss about the various bones and joints. **CO.104** Categories the various homeostatic mechanism and diseases caused by their imbalance **CO.105** Infer the knowledge about the gross morphology, structure and functions of nervous systems in the human body
2	**PS102**	Pharmaceutical analysis I (Theory)	Upon completion of the course the student shall be able to **CO.106** llustraate relevance & significance of Analytical Chemistry to Pharmaceutical sciences Clarify the basic principles of data treatment and data handling. **CO.107** Explain the basic concepts and principles of aqueous acid base titrations and clarify need of non-aqueous acid base titrations. **CO.108** Clarify the different terms, basic principles and reaction conditions of precipitation, Complexation and redox reaction. **CO.109** Understand and concept of electro chemical methods. **CO.110** Utilise the concept of oxidation and reduction in redox titrations
3	**PS103**	Pharmaceutics – I (Theory)	Upon completion of the course the student shall be able to **CO.111** Understand the history of Pharmacy profession **CO.112** Infer the knowledge of handling a prescription **CO.113** Understanding the importance of different incompatibilities and possibilities of overcoming them **CO.114** To know about preparation and evaluation of different dosaee forms **CO.115** Know about excipients used in different dosa•e forms **CO.116** Examine the stabiliw problems of biphasic I iquid dosage forms

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

4	**PS104**	Pharmaceutical inorganic chemistry – I (Theory)	Upon completion of the course the student shall be able to **CO.117** Infer about the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals **CO.118** Understand principles and working procedures involved in limit tests for commonly observed impurities **CO.119** Identify different anions, cations and different inorganic pharmaceuticals. **CO.120** Find different types of inorganic pharmaceuticals and their analysis **CO.121** Examine the medicinal and pharmaceutical importance of inorganic compounds
5	**HS105**	Communication skills (Theory)	Upon completion of the course the student shall be able to **CO.121** Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation **CO.122** Communicate effectively (Verbal and Non- Verbal) **CO.123** Explain Technical and Business Communication **CO.124** Effectively manage the team as a team player **CO.125** Utilize knowledge of various soft skills like Empathy, Negotiation skills etc. **CO.126** Develop interview skills **CO.127** Develop Leadership qualities and essentials
6	**BS105**	Remedial biology (Theory)	Upon completion of the course the student shall be able to **CO.128** Cell biology (Basic Nature of Plant cell and Animal cell) **CO.129** Classification System of both Plants & Animals **CO.130** Various tissue system and organ system in plant and animals **CO.131** Theory of evolution **CO.132** Anatomy and Physiology of plants and animals
7	**BS107**	Remedial mathematics	Upon completion of the course the student shall be able to **CO.133** Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences. **CO.134** Create, use and analyze mathematical representations and mathematical relationships. **CO.135** Communicate mathematical knowledge and understanding to help in the field of Pharmacy **CO.136** Perform abstract mathematical reasoning
8	**PS108**	Human Anatomy & Physiology-I Lab	On completion of the course student will able to **CO.137** Understand the uses and application of compound microscope **CO.138** Interpret the various tissues of human body under microscope **CO.139** Identify the various bones of human body. **CO.140** Infer the uses and application of hemocytometer.

			CO.141 Analyse the blood sample for blood group determination, bleeding time, clotting time, blood cells counting **CO.142** Determine heart rate and Pulse rate, blood pressure measurement by prescribed methods
9	**PS109**	Pharmaceutical Analysis-I Lab	On completion of the course student will able to **CO.143** Develop the ideas with the fundamentals of analytical chemistry among the pupil. **CO.144** Construct the fundamental methodology to prepare different strength of solutions **CO.145** Facilitates to predict the sources of mistakes, impurities and errors. **CO.146** Develop the fundamentals of volumetric analytical skills **CO.147** Specuates the basic knowledge in the principles of assays of compounds in volumetric analytical Techniques like precipitation, Neutralization, complexometric, Non aqueous and Redox Titration methods.
10	**PS110**	Pharmaceutics-I Lab	On completion of the course student will able to **CO.148** Preparation of different dosage forms as per prescibed formulae and methods. **CO.149** Fundamentals of basic liquid dosage forms **CO.150** Discuss and perform the preparation, sieving and packing of powders **CO.151** Develop various types of emulsions. **CO.152** Preparation and evaluation of suppositories **CO.153** Preparation and evaluation of ointments.
11	**PS111**	Pharmaceutical Inorganic Chemistry – I Lab	On completion of the course student will able to **CO.154** Understand the preparation and purification of different inorganic compounds and compare their properties. **CO.155** Analyse heavy metals by limit test and apply them in different pharmaceutical substance. **CO.156** Analyze normality, molarity, molality and report them **CO.157** Evaluate purity of samples using various analytical techniques. **CO.158** Explain concepts related to awareness of hazards and their precautionary measures. **CO.159** Apply practical skills acquired in quantitative analysis for future analysis of medicinal compounds.
12	**HS112**	Communication skill – Lab	On completion of the course student will able to **CO.160** Apply communication skill to communicate verbally and nonverbally **CO.161** Explain direct and indirect speech **CO.162** Apply figure of speech in writing effectively **CO.163** Develop interview skills **CO.164** Remember etiquettes while composing an email **CO.165** Design structure and plan a presentation
13	**BS113**	Remedial Biology – Lab	On completion of the course student will able to **CO.166** Understand the uses and application of compound microscope

			CO.167 Explain the different types of parts of plants and study about frog **CO.168** Examine the various tissues of plants under microscope. **CO.169** Identify the different type of bones in human body **CO.170** Evaluate the blood sample for blood group determination. **CO.171** Determine blood pressure and tidal volume.
B. Pharmacy I year II Semester			
14	**PS201**	Human anatomy and physiology–II (Theory)	Upon completion of the course the student shall be able to **CO.201** Explain Basic fundamentals structural features of neurons, mechanism of neurotransmitters along with processes of neuroconduction and neurotransmission. **CO.202** Clarify concepts and knowledge of anatomy, physiology & disorders of nervous system. **CO.303** Identify the various organs of different systems of human body. **CO.204** Explain concepts and knowledge of anatomy, physiology & disorders of respiratory system. **CO.205** Explain and discuss knowledge of and urinary system and endocrine system involve in regulation of Body functions & how all parts of the human body contribute to the maintenance of homeostasis. **CO.206** Describe organs involve in reproductive system, genetics, and aging process each contributes to the reproduction, growth and development of a human body.
15	**PS202**	Pharmaceutical organic chemistry – I (Theory)	Upon completion of the course the student shall be able to **CO.207** Explain basic concepts and principles of organic chemistry and will be able to explain hybridization of atomic orbital of C, N, O **CO.208** Assign IUPAC name and write structure of organic molecules of given IUPAC name containing diverse functional group **CO.209** Recognize stereoisomers, assign configuration to stereoisomers and correlate the effect of intermolecular and intramolecular forces of attraction on structure property relationship

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			CO.210 Differentiate classes of reactions, reagents, intermediate and types of reaction mechanism and recognize various factors that affect strengths of acids and bases **CO.211** Memorize mechanism, stereochemistry of elimination reactions and describe mechanism of addition reactions in alkenes, alkynes and summarize general methods of preparation of alkanes, alkenes and alkynes **CO.212** Account for reactivity/stability of compounds,
16	**BS203**	Biochemistry (Theory)	Upon completion of the course the student shall be able to **CO.213** To understand the importance of metabolism of substrates. **CO.214** Will acquire chemistry and biological importance of biological macromolecules **CO.215** Extend the knowledge of biochemical morphology to explain transport across biomembrane. **CO.216** Illustrate and write the classification, structure, chemistry and biochemical role of different biomolecules like proteins, carbohydrates, lipids and vitamins. **CO.217** Outline various metabolic pathways, their integration and significance. **CO.218** Categorize nucleic acids; describe their chemistry, biochemical role and processes like replication, transcription, translation.
17	**BS204**	Pathophysiology (Theory)	Upon completion of the course the student shall be able to **CO.219** Describe the etiology and pathogenesis of the selected disease states **CO.220** Knowledge of signs and symptoms of the diseases **CO.221** Identify the complications of the diseases. **CO.222** Know most commonly encountered pathophysiological state(s) and/or disease mechanism(s), as well as any clinical testing requirements
18	**CS205**	Computer applications in pharmacy (Theory)	Upon completion of the course the student shall be able to **CO.223** Understand different types of databases, applications of computers and databases in pharmacy **CO.224** Illustrates the concept of number system in computers.

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			CO.225 Make use of web technologies such as HTML, XML, CSS, programming languages, Web servers and pharmacy drug database. **CO.226** Appraise the applications of computers in pharmacy such as drug information services, pharmacokinetics, mathematical model in drug design, hospital and clinical pharmacy etc.. **CO.227** Explain about bioinformatics and its impact in vaccine discovery. **CO.228** Elaborate the applications of computers for data analysis in preclinical development.
19	**PS206**	Human anatomy and physiology II Lab	Upon completion of the course the student shall be able to **CO.229** Determine platelet count, reticulocytes count and osmotic fragility of blood sample **CO.230** To identify the different bones of human skeleton and joints **CO.231** Acquire the knowledge regarding health education in human life such as various devices of family planning and first aid
20	**PS207**	Pharmaceutical organic chemistry I Lab	Upon completion of the course the student shall be able to **CO.232** Identify/confirm the unknown organic compound **CO.233** Knowledge about the naming reactions of carbonyl compounds **CO.234** Demonstrate conduct of experiment effectively and safely in the organic chemistry laboratory **CO.235** To perform common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration, etc. **CO.236** Apply laboratory skills to identify organic compound by qualitative analysis and synthesis of their derivatives containing diverse functional group **CO.237** Synthesize different organic compounds and able to explain reaction mechanism behind the synthesis
21	**BS208**	Biochemistry Lab	Upon completion of the course the student shall be able to **CO.238** Demonstrate laboratory skills to identify biomolecules by qualitative and quantitative tests. **CO.239** To acquire knowledge in qualitative and quantitative estimation of the biological macromolecules. **CO.340** To know the interpretation of data emanating from a Clinical Test Lab. **CO.241** Isolate and identify biomolecules from various natural products. **CO.242** Apply the gel electrophoresis as isolation technique.
22	**CS209**	Computer applications in pharmacy Lab	Upon completion of the course the student shall be able to **CO.243** Demonstrate and make use of MS Office, MS Word, MS Excel, MS Access and MS Power point. **CO.244** Understand the paradigms of program languages and be exposed to at least one language from each model, C and SQL. **CO.245** Summarize the report and printing the report from patient database

			CO.246 Design a questionnaire using a word processing package to gather information about a particular disease. **CO.247** Create HTML web page to show personal information **CO.248** Create mailing labels Using Label Wizard , generating label in MS WORD
		B. Pharmacy II year I Semester	
23	**PS301**	Pharmaceutical Organic Chemistry – II (Theory)	Upon completion of the course the student shall be able to **CO.3011** Basic knowledge regarding general methods of preparation of organic compounds. **CO.302** Understand the reactions of some organic compounds. **CO.303** To understand Reactivity of organic compounds. **CO.304** Special emphasis on mechanisms and orientation of chemical reactions **CO.305** To acquire knowledge in heterocyclic compounds **CO.306** To acquire knowledge about the electrophilic and nucleophilic reactions.
24	**PS302**	Physical Pharmaceutics – I (Theory)	Upon completion of the course the student shall be able to **CO.307** Utilize the principles of gases state of matter and phase rule for formulation of stable aerosols and emulsions **CO.308** Understand crystal habit, methods of crystal analysis and the importance of polymorphism in solubility and design of dosage forms. **CO.309** Explain solubility, calculate molecular weight, understand distribution phenomenon and utilize them in understanding absorption of drugs. **CO.310** Analyze the chemical stability tests of various drug products **CO.311** Understand the laws of thermodynamics & concept of enthalpy. **CO.312** Understand of physicochemical properties of drugs including solubility, distribution, adsorption, and stability.
25	**BS303**	Pharmaceutical Microbiology (Theory)	Upon completion of the course the student shall be able to **CO.313** Acquire, articulate, retain and apply specialized language and knowledge relevant to microbiology. **CO.314** Acquire and demonstrate competency in laboratory safety and in routine and specialized microbiological laboratory skills applicable to microbiological research or clinical methods, including accurately reporting observations and analysis. **CO.315** Communicate scientific concepts, experimental results and analytical arguments clearly and concisely, both verbally and in writing.
26	**PC304**	Pharmaceutical Engineering (Theory)	Upon completion of the course the student shall be able to **CO.316** Understand basic principles of industrial process involved in processing of drug and excipients. **CO.317** Understand basic principles of process engineering and to develop new pharmaceutical process and modify existing one.

			CO.318 Apply basic principles of unit operations like crystallization, Drying, Distillation, Extraction, mass transfer, heat transfer etc. where it involves. **CO.319** Apply advance modules as per the changing priorities and requirements of the modern pharmaceutical industries **CO.320** Understand the fundamental principles and facts in pharmaceutical engineering about Unit operations **CO.321** Understand the material handling techniques.
27	**PS305**	Pharmaceutical Organic Chemistry II Lab	Upon completion of the course the student shall be able to **CO.322** Demonstrate laboratory skills to separate and identify the organic compounds from the given unknown binary organic compounds having different functional reactive groups (solid-solid binary mixture **CO.323** Demonstrate and explain techniques like column chromatography **CO.324** Synthesize organic compounds based on molecular rearrangements
28	**PS306**	Physical Pharmaceutics I Lab	Upon completion of the course the student shall be able to **CO.325** Calculate Critical solution temperature, evaluate the effect of addition of electrolyte on Critical solution temperature of phenol –water system and construct ternary phase diagram for three component systems. **CO.326** Calculate solubility of substance at different temperature, in different solvents, understand the effects of co-solvents on solubility and the importance of partition co-efficient required for preformulation studies. **CO.327** Calculate the heat of solution for some components **CO.328** Calculate and evaluate unknown concentration of electrolytes by conduct metric titrations
29	**BS307**	Pharmaceutical Microbiology Lab	Upon completion of the course the student shall be able to **CO.329** Demonstrate isolation of and identification of microbes. **CO.330** Acquire knowledge about validating the microbiological equipment and reporting the observations **CO.331** Describe the applications of antibiotic assay, sterility testing of WFI & MIC (minimum inhibitory concentration)) in the field of pharmacy and emphasize their principles.
30	**PC308**	Pharmaceutical Engineering Lab	Upon completion of the course the student shall be able to **CO.332** Perform various processes involved in pharmaceutical manufacturing process. **CO.333** Appreciate and comprehend significance of plant lay out design for optimum **CO.334** Appreciate the various preventive methods used for corrosion control in Pharmaceutical industries
		B. Pharmacy II year II Semester	
31	**PS401**	Pharmaceutical Organic Chemistry – III (Theory)	Upon completion of the course the student shall be able to **CO.401** Understand the basic principles of heterocyclic chemistry. **CO.402** Draw the structures and synthesize simple pharmaceutically active organic compounds having five and six membered heterocyclic compounds. **CO.403** Infer detailed mechanisms for common name reaction

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			CO.404 Apply experimental techniques, procedures and safe laboratory practices with the application of theoretical knowledge **CO.405** Identify Stereo-chemical features of drug molecules i.e optical geometric isomers **CO.406** Apply the knowledge of medicinal value of heterocyclics in choosing pharmacophore design.
32	**PC402**	Medicinal Chemistry – I (Theory)	Upon completion of the course the student shall be able to **CO.407** Examine the relationship between various physicochemical properties of the drugs to their biological activity **CO.408** Explain the significance of various biologically active scaffolds and their relation to biological activity. **CO.409** Infer the synthetic schemes and reactions involved in the synthesis of various drugs. **CO.410** Understand the concept of SAR and mechanism of action of various classes of drugs acting on ANS and CNS. **CO.411** Apply the medicinal chemistry knowledge of various classes of drugs for Drug design **CO.412** Identify structures of various antidotes in drug poisoning and their implications
33	**PC403**	Physical pharmaceutics – II (Theory)	Upon completion of the course the student shall be able to **CO.413**Describe the types of colloids and their characteristics. **CO.414** Infer the rheoloeicai properties and order of reaction **CO.415** Describe the concepts of physicochemical properties of drugs and understand their importance in designing dosage formulation. **CO.416** Compare the concepts and properties of suspensions and emulsions. **CO.417** Evaluate the suitable method to determine the particle size of powders. **CO.418** Understand the principles of chemical kinetics and utilize them for stability testing and to interpret the expiry datQdf P all IS formulations.
34	**PC404**	Pharmacology – I (Theory)	Upon successful completion of the course, students will be able to: **CO.419** Understand the basic concepts of Pharmacology like mechanism of action, physiological and biochemical effects (pharmacodynamics) as well as absorption, distribution, metabolism and excretion (pharmacokinetics) **CO.420** Explain the principles and mechanisms of drug action at receptor levels (Pharmacodynamics). **CO.421** Describe about the drug adverse effects, clinical uses,drug interactions and drug discovery. **CO.422** Discuss the Pharmacological action, uses, adverse ffects, interactions and mechanism actions of drugs

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			acting on Peripheral nervous system and on their related disorders. **CO.425** Understand the Pharmacological action, uses, adverse effects, interactions and mechanism action of drugs acting on Central nervous system and on their associated disorders. **CO.426** Describe about the Pharmacological action, uses, adverse ffects, interactions and mechanism action of Psychopharmacological agents related drugs and disease.
35	**PC405**	Pharmacognosy & Phytochemistry – I (Theory)	Upon successful completion of the course, students will be able to: **CO.427** Describe meaning and significance of Pharmacognostic parameters of crude drugs. **CO.428** Outline reason of evolutionary significance of secondary metabolites production in plants and other organism and deduce their significance as medicinal molecules. **CO.429** Discriminate primary and secondary metabolites from their source and explain their industrial applications. **CO.430** Explain definition, source, classification, chemical structure, uses, and summaries biosynthetic pathway of primary and secondary metabolites. **CO.431** Illustrate methods of extraction and explain rationale behind qualitative and quantitative analysis of primary and secondary metabolites. **CO.432** Develop skills for sectioning of plant material, staining, mounting and focusing; choose staining reagents required for specific part of plant. **CO.433** Draw morphological and microscopical diagrams, label component and judge purity of crude drugs. **CO.434** Assemble extraction apparatus, isolate single component and evaluate them by various chemical and physical parameters. **CO.435** Operate various equipments as per SOPs and principle of experiments
36	**MC 400**	Gender Sensitization Lab	Upon successful completion of the course, students will be able to: **CO.436** Developed a better understanding of important issues related to gender in contemporary India. **CO.436** Sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender **CO.437** Grasp of how gender discrimination works in our society and how to counter it.

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			CO.438 Acquire insight into the gendered division of labour and its relation to politics and economics.
37	**PC406**	Medicinal Chemistry –I Lab	Upon successful completion of the course, students will be able to: **CO.439** Calculate the partition coefficient values of various medicinal compounds and correlation with the biological activity. **CO.440** Understand the basic principles and reaction mechanisms involved in the synthesis of drugs. **CO.441** Calculate the amount of active pharmaceutical ingredient present in the dosage form. **CO.442** Apply purification techniques like recrystallisation, reflux condensation and vaccum filtration. **CO.443** Design the scheme involved in the synthesis of intermediates.
38	**PS407**	Physical Pharmaceutics – II Lab	Upon successful completion of the course, students will be able to: **CO.1** Understand the pre formulation parameters-bulk density,true density and porosity of powders and working of Brookfield viscometer **CO.444** Examine the flow properties of powders by angle of repose, carrs consolidation index and hausner's ration. **CO.445** Identify the particle size distribution by sieving and microscopy method. **CO.446** Analyse the stability by carrying out accelerated stability studies Interpret a suitable suspending agent based on sedimentation olume. **CO.447** Calculate the viscosity of liquids by ostwalds viscometer and viscosity of semisolids by brookfield viscometer. **CO.448** Find out reaction rate constant of first and second order constant by acid and alkaline hydrolysis.
39	**PC408**	Pharmacology – II Lab	Upon successful completion of the course, students will be able to: **CO.449** Learn the working of various equipments used in pharmacology. **CO.450** Infer about the maintenance of animal laboratory according CPCSEA Guidelines. **CO.451** Describe the methods of blood withdrawal, various drug administrations to various types of animals. **CO.452** Apply simulated experiments to understand isolation of different organs/tissues from the laboratory animals. **CO.453** Use simulated experiments to interpret the effect of drugs on animals. **CO.454** Explain the various receptor actions using isolated tissue preparation
40	**PC409**	Pharmacognos y and Phytochemistry – I Lab	Upon successful completion of the course, students will be able to: **CO.455** Understand the chemical identification some crude drugs by performing specific chemical test. **CO.2** Calculate microscopically size of starch grains, fibres and calcium oxalate crystals by using eye piece micrometer. **CO.456** Identify qualitative evaluation of physical parameters of crude drugs like moisture content, ash value and extractive value. **CO.457** Apply microscopic determination for evaluation of vein islet number, vein termination, palisade ratio,

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			stomatal number andindex of crude drugs.
		B. Pharmacy III year I Semester	
41	PS501	Medicinal chemistry – II (Theory)	Upon successful completion of the course, students will be able to: **CO.501** Write the chemical synthesis of some drugs. **CO.502** Know the structural activity relationship of different class of drugs. **CO.503** Acquire knowledge about the mechanism pathways of different class of medicinal compounds. **CO.504** Acquire knowledge about the chemotherapy for cancer. **CO.505** Understand the chemistry of drugs with respect to their pharmacological activity.
42	PS502	Industrial Pharmacy – I (Theory)	Upon successful completion of the course, students will be able to: **CO.506** Interpret preformulation studies and its application in development of different dosage forms. **CO.507** Understand the methods of preparation and evaluation of solid dosage forms. **CO.508** Infer importance of parenterals and aerosols.evaluation of its efficacy. **CO.509** Compare the methods of preparation. analysis and evaluation of different cosmetics. **CO.510** Apply the concept in selection of suitable packaoine material tor pharmaceutical products.
43	PS503	Pharmacology – II (Theory)	Upon successful completion of the course, students will be able to: **CO.511** Students would have understood the mechanism of drug action and its relevance in the treatment of different diseases **CO.512** They would be trained with isolation of different organs/tissues from the laboratory animals by simulated experiments **CO.513** They would have observed the various receptor actions using isolated tissue preparation **CO.514** Students would appreciate the correlation of pharmacology with related medical sciences **CO.515** They would have understood the cell communication mechanism **CO.516** They would appreciate the newer targets of several disease conditions for treatment **CO.517** Explain OECD guidelines (425) for Acute oral toxicity. **CO.518** Explain principles of bioassay, its types including advantages and disadvantages.
44	PS504	Pharmacognosy and Phytochemistry – II (Theory)	Upon successful completion of the course, students will be able to: **CO.519** Differentiate underlying reason of evolutionary significance of alkaloids formation in plants and other organism and deduce their significance as medicinal molecules. **CO.520** Explain definition, classification, source, chemical structure, uses, and summaries biosynthetic pathway of alkaloids, terpenoids and resins. **CO.521** Illustrate methods of extraction and explain rationale behind qualitative and quantitative analysis of alkaloids, terpenoids and resins. **CO.522** Describe historical significance, contribution of alkaloids in modern drug discovery and currently

			marketed semisynthetic analogue. **CO.523** Develop skills for sectioning of plant material, staining, mounting and focusing; choose staining reagents required for specific part of plant.
45	**PS508**	Cosmetic science (Theory)	Upon successful completion of the course, students will be able to: **CO.524** Apply the steps of the cosmetic development process to be able to navigate the decision making required to formulate, manufacture and market a cosmetic product. **CO.525** Utilize concepts of functional classes of raw materials in sourcing and selection of ingredients for synthetic, natural and organic cosmetic products. **CO.526** Modify cosmetic formulations to achieve stable products with prescribed sensory properties. **CO.527** Analyze a finished product against regulatory requirements to ensure compliance for sales and marketing in global jurisdictions. **CO.528** Summarize current literature of product components and packaging to communicate ethical, health and environmental concerns to relevant stakeholders. **CO.529** Construct an appropriate product evaluation strategy for claims substantiation, safety and shelf life documentation.
46	**PS509**	Industrial Pharmacy – I Lab	Upon successful completion of the course, students will be able to: **CO.530** Analy ze different reformulation studies for various drug s . **CO.531** Pre pare different solid dosage forms and evaluate their parameters. **CO.532** Understand coating process for granule and tablets. **CO.533** Prepare and analyze the quality of different parenteral dosage forms. **CO.534** Prepare and evaluate different semisolid dosage form **CO.535** Describe different packing material for dosage form
47	**PS5010**	Pharmacology –II Lab	Upon successful completion of the course, students will be able to: **CO.536** Learn about in-vitro pharmacological experiments and equipments used in pharmacology. **CO.537** Describe about the monitoring of blood pressure **CO.538** Perform bioassay of drugs like histamine, oxytocin, serotonin and acetylcholine. **CO.539** Understand determination of PA_2 and PD_2 value of drug

			CO.540 Use simulated experiments to understand the isolation of different organs/tissues from the laboratory animals **CO.541** Apply simulated experiments to interpret the effect of drugs in animals
48	**PS511**	Pharmacognosy and Phytochemistry Lab	Upon successful completion of the course, students will be able to: **CO.542** Analyses transverse sections and powdered samples of some important crude drugs and describes its microscopic characteristics. **CO.543** Describe morphology and carries out extraction and detection of some important crude drugs. **CO.544** Infers and performs isolation active principles from respective natural sources and detects them. **CO.545** Apply paper chromatography for separation of sugars and developed TLC of herbal extract for detection of phytoconstituents **CO.546** Evaluate TLC for detection of phytoconstituents Perform distillation of volatile oils. **CO.547** Analyze some crude drugs for chemical identification by performing chemical tests.
49	**MC500**	Environmental sciences (Theory)	Upon successful completion of the course, students will be able to: **CO.548** Extend basic knowledge on environment and its allied problems **CO.549** Compare the natural, renewable and non renewable resources and the problems associated with them **CO.550** Motivate the learners to participate in environment protection and improvement. **CO.551** Analyze the concepts of eco system including structure and functions. **CO.552** Adopt skills in identifying and solving environmental problems. **CO.553** Develop an attitude of concern for the environment.
		B. Pharmacy III year II Semester	
50	**PS601**	Medicinal chemistry – III (Theory)	Upon completion of the course student shall be able to **CO.601** Understand the importance of drug design and different techniques of drug design. **CO.602** Understand the chemistry of drugs with respect to their biological activity. **CO.603** Know the metabolism, adverse effects and therapeutic value of drugs. **CO.604** Know the importance of SAR of drugs
51	**PS602**	Pharmacology – III (Theory)	Upon completion of this course the student should be able to:

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			CO.605 Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases **CO.606** Comprehend the principles of toxicology and treatment of various poisonings and appreciate correlation of pharmacology with related medical sciences.
52	**PS603**	Herbal Drug Technology (Theory)	Upon completion of this course the student should be able to: **CO.607** Understand raw material as source of herbal drugs from cultivation to herbal drug product **CO.608** Know the WHO and ICH guidelines for evaluation of herbal drugs **CO.609** Know the herbal cosmetics, natural sweeteners, nutraceuticals **CO.610** Appreciate patenting of herbal drugs, GMP .
53	**PS604**	Biopharmaceutics &Pharmacokinetics (Theory)	Upon completion of the course student shall be able to: **CO.611** Understand the basic concepts in biopharmaceutics and pharmacokinetics. **CO.622** Use plasma data and derive the pharmacokinetic parameters to describe the process of drug absorption, distribution, metabolism and elimination. **CO.613** Critically evaluate biopharmaceutic studies involving drug product equivalency **CO.614** Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters. **CO.615** Detect potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them
54	**PS605**	Pharmaceutical Quality Assurance (Theory)	Upon completion of the course student shall be able to: **CO.6I6** Define the responsibilities of QA and QC departments **CO.617** Understand the concept of quality management, evaluate the process of quality audit and review

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			CO.618 Distinguish among the cGMP and GLP aspects in relevance to pharmaceutical industry **CO.619** Interpret the process pertaining to various aspects of documentation organize validation parameters related to analytical methods **CO.620** Demonstrate the scope of quality certifications applicable to pharmaceutical industries **CO.621** Plan the significance of qualification and calibration procedure for various analytical instruments
54	**MC600**	Human Values and Professional Ethics (Theory)	Upon completion of the course student shall be able to: **CO.622** Understand the importance of Values and Ethics in their personal lives and professional careers. **CO.623** Know the rights and responsibilities as an employee, team member and a global citizen.
56	**PS609**	Medicinal Chemistry – III Lab	Upon completion of the course student shall be able to: **CO.624** Carryout the quantitative analysis of various medicinal compound **CO.625** Understand various reactions for synthesis of medicinal compound **CO.626** Infer application of microwave technique in synthesizing medicinal compounds **CO.627** Examine the usage of Chem draw software to draw structure and rections of medicinal compound **CO.628** Analyze various physicochemical properties of medicinal compounds
57	**PS610**	Pharmacology – III Lab	Upon completion of the course student shall be able to: **CO.629** Understand about dose calculation in pharmacology experiments. **CO.630** Identify the methods of inducing different diseases to various types of animals. **CO.631** Use simulated experiments to understand isolation of different organs/tissues from laboratory animals. **CO.632** Describe about determination of acute skin and eye irritation/Corrosion of test substances. **CO.633** Apply simulated experiments to interpret the effect of drugs on animals. **CO.634** Discuss the application of Biostatistics in various pharmacological experiments.
58	**PS611**	*Herbal Drug Technology Lab*	Upon completion of the course student shall be able to: **CO.635** Examine crude drug sample by preliminary phytochemical screening

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			CO.636 Calculate alcohol content of Asava and Arista **CO.637** Produce herbal cosmetics and conventional herbal formulation by incorporating prepared and standardize extracts **CO.638** Evaluate excipient of natural origin and analyze monograph of herbal drugs from recent pharmacopoeia **CO.639** Calculate percentage of aldehyde, phenol and total alkaloid content in extract
		B. Pharmacy IV year I Semester	
59	**PS701**	Instrumental Method of Analysis (Theory)	Upon completion of the course student shall be able to: **CO.701**Apply the principles, instrumentation involved in various analytical instrument, and their applications in Pharmaceutical industry and research. **CO.702** Understand the aspects of separation for multi components. **CO.703** Analysis drugs and excipients using various instrumentation techniques. **CO.704** Make accurate analysis and report the results in defined formats. **CO.705** Analyze test samples, Active Pharmaceutical Ingredients (APIs) and formulations using above instrument. **CO.706** Process & interpret the data obtained through experimentation and report the results as per regulatory requirements.
60	**PS702**	Industrial Pharmacy – II (Theory)	Upon completion of the course student shall be able to: **CO.707** Know the importance of pilot plant scaleup technique **CO.708** Learn about technology development and transfer **CO.709** Know the application of regulatory affair. **CO.710** Evaluate and know the importance or regulatory requirement for the new drug approval **CO.711** Understand the importance of quality management system. **CO.712** Know the importance of Indian regulatory requirements.
61	**PS703**	Pharmacy Practice	Upon completion of the course student shall be able to:

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

		(Theory)	**CO.713** Know the various drug distribution methods in hospitals **CO.714** Appreciate the pharmacy stores management and inventory control **CO.715** Monitor the drug therapy of the patients through medication chart review and obtained medication history interview and counsel the patient **CO.716** To identify and detect drug related problem and assess adverse drug reaction **CO.717** Interpreted selected laboratory results **CO.718** Describe patient counseling in community pharmacy and appreciate the concept of rational drug therapy.
62	**PS704**	Novel Drug Delivery System (Theory)	Upon completion of the course student shall be able to: **CO.719** Select appropriate drug candidates and calculate the dose for formulation of Modified Drug Release System. **CO.720** Describe, classify and select appropriate Polymers for formulating modified release systems. **CO.721** Describe merits, demerits, application, formulation and evaluation of Novel Drug Delivery Systems. **CO.722** Explain manufacturing techniques, product evaluation and safety considerations of Therapeutic aerosols. **CO.723** Explicate the merits, demerits, applications, formulation techniques and evaluation of Microcapsules. **CO.724** Describe the basic concept of Optimization, factors, variables and apply it in design of experiments.
63	**PS707**	Pharmacovigilance (Theory)	Upon completion of the course student shall be able to: **CO.725** Understand history and development of pharmacovigilance and understand drug safety monitoring scenario in India **CO.726** Describe process of identification, reporting and assessment of new adverse drug reactions. **CO.727** Find about dictionaries, coding, terminologies and communications used in pharmacovigilance. **CO.728** Examine the methods to generate safety data during pre-clinical and specific populations like paediatrics,

			geriatrics, pregnancy and lactation **CO.729** Identify the various guidelines like ICH and ICSR **CO.730** Discuss about international guidelines like CIOMS.
64	**PS709**	Instrumental Method of Analysis Lab	Upon completion of the course student shall be able to: **CO.731** Describes the assay of compounds by Spectroscopic methods. **CO.732** Understand the assay of compounds by simultaneous methods. **CO.733** Studies quenching of fluorescence. **CO.734** Understand the Determination of alkaline earth metals by flame photometry. **CO.735** Illustrates the Separation of compounds by chromatographic methods. **CO.736** Explains the techniques like HPLC and Gas Chromatography.
65	**PS710**	Practice School	Upon completion of the course student shall be able to: **CO.737** To design and describe the experimental procedures and evaluations. **CO.738** To illustrate the principle involved in the drug discover process **CO.739** To acquire the hands — on- training on the equipments used in the various drug development process and quality control. **CO.740** To analyse the theoretical skills, compare and contrast with the practical technical skills. **CO.741** To develop the practical skills so as to assess the problems encountered while working on the instruments
66	**PS711**	Industrial training	Upon completion of the course student shall be able to: **CO.742** Understand the Organizational Structure of a company. **CO.743** Develop work habits and attitudes necessary for job success (technical competence, professional attitude, organization skills etc.) **CO.744** Develop written communication and technical report writing skills.

SREE DATTHA INSTITUTE OF PHARMACY Sheriguda

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R Dist., Greater Hyderabad 501510. T.S
Ph: +91 8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			CO.745 Develop knowledge of contemporary issues.
			B. Pharmacy IV year II Semester
67	PS801	Biostatistics and Research Methodology (Theory)	Upon completion of the course student shall be able to: **CO.801** Describe basics of biostatistics, measures of central tendency, measures of dispersion and correlation **CO.802** Illustrates the regression methods and concept of probability. **CO.803** Understands various techniques of analysis of variance (ANOVA) including parametric and nonparametric methods. **CO.804** Introduce about research, types of graphs, design of research methodology. **CO.805** Infer the concept of hypothesis testing and statistical softwares. **CO.806** Explains about design and analysis of experiments
68	PS802	Social and Preventive Pharmacy (Theory)	Upon completion of the course student shall be able to: **CO.807** Understands fundamentals of health and disease, sociology and hygienist. **CO.808** Describes prevention and control of some infectious diseases **CO.809** Create awareness on national health programs **CO.810** Explain mother and child care, elderly health care and family welfare programs **CO.811** Intervenes role of WHO in Indian nation programs **CO.812** Illustrates community services in rural, urban and schools.
69	PS803	Pharmaceutical Jurisprudence (Theory)	Upon successful completion of the course, students will be able to: **CO.813** Understand detailed study of various rules and regulations of import, manufacture and conditions for grant of license for manufacture of different categories of drugs and describes Schedules to act and rules of Drugs

			and Cosmetics Act 1940 and its rules 1945 in India **CO.814** Infers detailed study of various schedules of the D & C act. Discuss rules and regulations of packing, label King and sale drugs and explains administration of Drugs and Cosmetics Act 1940 and its rules 1945 in India **CO.815** Identify the importance of application of Pharmacy act 1948 for pharmacy education regulations and registration as pharmacist in India **CO.816** Describes the role of Medicinal and toilet preparations act 1955 and Narcotic Drugs and Psychotropic substances Act-1985 and Rules in India to control misuse of alcohol and prevent drug addiction respectively. **CO.817** Categories the prohibited advertisements as per drugs and magic remedies (objectionable advertisements) Act 1954, infers regulation of prevention of cruelty to animals act 1960. **CO.818** Analyze the evolution of Drug legislation in India and importance of other acts like Medical Termination of Pregnancy Act, Right to Information Act and Intellectual Property Rights (IPR) and describes code of Pharmaceutical ethics and Pharmacist oath.
70	PS804	Computer Aided Drug Design (Theory)	Upon successful completion of the course, students will be able to: **CO.819** Understanding how drugs function at the molecular level. **CO.820** Understanding the relationships between physico-chemical properties of drugs and their biological activities. **CO.821** Knowing how drugs interact with receptors of different kinds. Knowing the types of interactions between drugs and receptors.

Sl. No.	Course code	Course name	Course outcomes statement
			PHARM. D.
Pharm.D. I Year			
1	1.1	Human Anatomy and Physiology (Theory)	Upon completion of the course student shall be able to: **CO.1.1.1** Describe the gross anatomy, morphology, structure and functions of various organs of human body at the cell and tissue level. **CO.1.1.2** Categorize the various Hemopoitric mechanisms ad their imbalance diseases. **CO.1.1.3** Understand the gross morphology, structure and function of various systems in the human body. **CO.1.1.4** Identify different types of family planning methods, devices and perform the pregnancy diagnosis test **CO.1.1.5** Appreciate coordinated working pattern of different organs of each system. **CO.1.1.6** Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body
2	1.2	Pharmaceutics (Theory)	Upon completion of the course student shall be able to: **CO.1.2.1** Understand the basic concepts of different dosage forms for formulating and dispensing. **CO.1.2.2** Utilize the knowledge of pharmaceutical posology in dose solution of various dosage form **CO.1.2.3** Knowing the importance of pharmacy and different pharmacopoeias. **CO.1.2.4** Explain the role of additives involved in development of various dosage forms. **CO.1.2.5** Utilizing the applications of surgical instruments used in hospitals. **CO.1.2.6** Analyze the instabilities in formulations and suggest suitable measures to overcome it.

3	1.3	Medicinal Biochemistry (Theory)	Upon completion of the course student shall be able to: **CO.1.3.1** Describe cell and biochemical organization explain the role of enzymes involved in metabolic process of carbohydrates. Protein, amino acids by animals' models **CO.1.3.2** Understand the metabolism and biological role of carbohydrates and lipids. **CO.1.3.3** Discuss the coenzyme system involved in the biological oxidation and electron transport chain. **CO.1.3.4** Analyse various organ functioning test. **CO.1.3.5** Examining various electrolyte in body fluids by conducting biochemical test **CO.1.3.6** Interpret various hormones, lipoproteins and protein levels in serum for better understanding the endocrine and various infectious disease.
4	1.4	Pharmaceutical Organic Chemistry (Theory)	Upon completion of the course student shall be able to **CO.1.4.1** Give systematic names to simple organic compounds and poly functional group. **CO.1.4.2** Achieve an understanding of the behavior of organic compounds and to establish a foundation for studies into natural and synthetic products of pharmaceutical interest. **CO.1.4.3** Acquire the knowledge and understanding of the basic experimental principles of pharmaceutical organic chemistry. **CO.1.4.4** Draw the structures and synthesize simple pharmaceutically active organic compounds. Describe detailed mechanisms for common reactions.
5	1.5	Pharmaceutical Inorganic Chemistry (Theory)	Upon completion of the course student shall be able to **CO.1.5.1** Acquainted with the principles of limit tests. Understand the principles and procedures of analysis of drugs and also regarding the application of inorganic pharmaceuticals. **CO.1.5.2** Acquire knowledge about the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals **CO.1.5.3** Appreciate the importance of inorganic pharmaceuticals in preventing and curing the disease. **CO.1.5.4** Know the analysis of the inorganic pharmaceuticals their applications.

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

6	1.6	Remedial Mathematics	Upon completion of the course student shall be able to **CO.1.6.1** Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences. **CO.1.6.2** Create, use and analyze mathematical representations and mathematical relationships **CO.1.6.3** Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy **CO.1.6.4** Perform abstract mathematical reasoning
7	1.7	Remedial Biology (Theory)	Upon completion of the course student shall be able to understand/learn **CO.1.7.1** Cell biology (Basic Nature of Plant cell and Animal cell) **CO.1.7.2** Classification System of both Plants & Animals **CO.1.7.3** Various tissue system and organ system in plant and animals **CO.1.7.4** Theory of evolution **CO.1.7.5** Anatomy and Physiology of plants and animals
8	1.1	Pharmaceutics (Practical)	Upon completion of the course student shall be able to understand/learn **CO.1.1.1P** Review the basic requirements in compounding and dispensing of pharmaceutical products **CO.1.1.2P** Applying the knowledge of different techniques involved in preparation of drug products. **CO.1.1.3P** Examine the incompatibilities observed in pharmaceutical dosage forms. **CO.1.1.4P** Conductine the doasee calculations for different aces. **CO.1.1.5P** Desien of apnropriate labels for dosaee forms **CO.1.1.6P** Examine the formulas used in different pharmacopoeias in development of various pharmaceutical dosage forms.
9	1.2	Medicinal Biochemistry (Practical)	Upon completion of the course student shall be able to **CO.1.2.1P** Analyze quantitative and qualitative analysis of normal constituents in urine **CO.1.2.2P** Analyze quantitative and qualitative tests to normal constituents in blood

			CO.1.2.3P Calculate the glucose levels in blood to identify diabetes mellitus **CO.1.2.4P** Correlate the results obtained from quantitative experiments with that of normal biochemical values **CO.1.2.5P** Examine lipids in blood. **CO.1.2.6P** Determine the electrolytes present in serum by using various diagnostic tests.
10	1.3	Pharmaceutical Organic Chemistry (Practical)	Upon completion of the course student shall be able to **CO.1.3.1P** Nomenclature of simple organic compounds in different classes and make 3DStereomodels to learn easily. **CO.1.3.2P** Determination of some important physical properties like m.pt, b.pt, solubility etc **CO.1.3.3P** Purification of Organic compounds **CO.1.3.4P** Synthesis of organic compounds and study about principles, reactions and mechanism. **CO.1.3.5P** Synthesis of organic compounds with named reactions and study about mechanisms. **CO.1.3.6P** Systemic qualitative analysis of some unknown organic compounds
11	1.4	Pharmaceutical Inorganic Chemistry (Practical)	Upon completion of the course student shall be able to **CO.1.4.1P** Understand the principles and procedures for analysis of inorganic pharmaceuticals their applications **CO.1.4.2P** Explain different pharmaceutical buffers, their preparations and uses in pharmaceutical system **CO.1.4.3P** Understand the medicinal importance of inorganic pharmaceuticals **CO.1.4.4P** Having basic knowledge about various impurities in pharmaceuticals and also principles and methods of limit tests to control common impurities in pharmaceutical substances.

			CO.1.4.5P To highlight the domain of radiopharmaceuticals used in the diagnostics and therapy
12	1.5	Human Anatomy and Physiology (Practical)	Upon completion of the course student shall be able to understand/learn **CO.1.5.1P** Demonstrate the principle and working of various instruments used in HAP. **CO.1.5.2P** Identify of microscopical features of various types of cells and tissues **CO.1.5.3P** Identify gross anatomy and physiology of various bones. **CO.1.5.4P** Perform hematological tests and also record BP, heart rate & pulse **CO.1.5.5P** Appreciate coordinated working pattern of different organs of each system. **CO.1.5.6P** Explain the physiology of skeletal muscle contraction
13	1.7	Remedial biology (Practical)	Upon completion of the course student shall be able to understand/learn **CO.1.7.1P** Know about the kingdoms of plants, basic concepts and components of animal with reference to human and know about the basic concept, history and background with pharmacognosy **CO.1.7.2P** Recognize about the different cell inclusions, cell wall components and some secondary metabolite **CO.1.7.3P** To know anatomy and physiology of animals in reference to human beings **CO.1.7.4P** Distinguish about the different methods of adulteration of crude drugs **CO.1.7.5P** Perform hematological tests and also record BP, heart rate & pulse
Pharm. D. Ii Year			
14	2.1	Pathophysiology (Theory)	Upon completion of the course student shall be able to **CO.2.1.1** Describe the etiology and pathogenesis of the selected disease states

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			CO.2.1.2 Demonstrate a basic understanding of the concepts and elements of disease **CO.2.1.3** Name the signs and symptoms of the diseases **CO.2.1.4** Mention the complications of the diseases **CO.2.1.5** Distinguish environmental factors, physical, psychosocial, and cognitive characteristics of various diseases and conditions. **CO.2.1.6** Identify implications of therapeutic interventions for diseases and conditions. **CO.2.1.7** Discuss common laboratory and diagnostic tests
15	2.2	Pharmaceutical Microbiology (Theory)	Upon completion of the course student shall be able to **CO.2.2.1** Understand the world of microbiology, identify the microorganism based on the morphology & structure and growth and nutritional requirements of the organism **CO.2.2.2** Identify the microorganism based on staining techniques and biochemical reactions **CO.2.2.3** Recognize the importance of sterilization and disinfectants process and aseptic conditions **CO.2.2.4** Realize the role of immune system in keep individual healthy and identify the disease by performing various diagnostic tests **CO.2.2.5** Describe how the microorganisms play a key role in assay of vitamins and antibiotics **CO.2.2.6** Describe various diseases – etiology, pathology, diagnosis and treatment
16	2.3	Pharmacognosy&Phyto pharmaceuticals (Theory)	Upon completion of the course student shall be able to **CO.2.3.1** Understand the basic principles of cultivation, collection and storage of crude drugs; **CO.2.3.2** Know the source, active constituents and uses of crude drugs **CO.2.3.3** Appreciate the applications of primary and secondary metabolites of the plant
17	2.4	Pharmacology - I (Theory)	Upon completion of the course student shall be able to

			CO.2.4.1 Define the basic terms of Medical Pharmacology **CO.2.4.2** Select the appropriate dose and routes for drugs administration **CO.2.4.3** Describe the pattern of absorption, distribution, metabolism and excretion of various drugs **CO.2.4.4** Classify the drugs based on the mechanism of action and indications **CO.2.4.5** Identify the types of adverse drug reactions, drug-drug interactions, food-drug interactions and contraindications **CO.2.4.6** Apply the pharmacological knowledge in therapeutic aspects
18	2.5	Community Pharmacy (Theory)	Upon completion of the course student shall be able to **CO.2.5.1** Provide patient-centered care to diverse patients using the best available evidence. **CO.2.5.2** Educate patients through counseling and provide health screening services in public. **CO.2.5.3** Identify symptoms of minor ailments and provide appropriate medication. **CO.2.5.4** Exhibit code of ethics and ensure rational use of drugs in practice. **CO.2.5.5** Participate in prevention programs of communicable diseases. **CO.2.5.6** Demonstrate knowledge of the entrepreneurial and management skills in community pharmacies.
19	2.6	Pharmacotherapeutics–I (Theory)	Upon completion of the course student shall be able to **CO.2.6.1** Describe the pathophysiology and management of cardiovascular, respiratory and endocrine diseases **CO.2.6.2** Develop the patient case-based assessment Skills **CO.2.6.3** Describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of these diseases **CO.2.6.4** Develop clinical skills in the therapeutic management of these conditions **CO.2.6.5** Continue to develop communication skills.

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			CO.2.6.6 Students will provide patient – centered care to diverse patients using the evidence-based medicine
20	2.2	Pharmaceutical Microbiology (Practical)	Upon completion of the course student shall be able to **CO.2.2.1P** Know microorganism growth multiplication and their industrial usage. **CO.2.2.2P** Able to identify specific organism by using morphological, cultural and biochemical test **CO.2.2.3P** To validate the efficiency of sterilization techniques and disinfection procedures **CO.2.2.4P** To make the environment free of microorganism by aseptic techniques **CO.2.2.5P** Critically interpret all the assessment methods to validate the disinfection and sterilization
21	2.3	Pharmacognosy&Phyto pharmaceuticals (Practical)	Upon completion of the course student shall be able to **CO.2.3.1P** Understand the Pharmacognosy laboratory and experiments **CO.2.3.2P** Carry out the transverse section of plant parts to understand the arrangement of cells and tissues **CO.2.3.3P** Compare the tissue system and to understand the purity of the drugs **CO.2.3.4P** Carry out the chemical tests to determine the purity of drugs and to understand the nature of chemical constituents present **CO.2.3.5P** Know the different evaluation methods for the drugs
22	2..6	Pharmacotherapeutics–I (Practical)	Upon completion of the course student shall be able to **CO.2.6.1P** Describe the pathophysiology and management of cardiovascular ,respiratory and endocrine diseases **CO.2.6.2P** Develop the patient case-based assessment Skills **CO.2.6.3P** Describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of these

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad 501510. T.S
Ph.:+91 8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			diseases **CO.2.6.4P** Develop clinical skills in the therapeutic management of these conditions **CO.2.6.5P** Continue to develop communication skills. **CO.2.6.6P** Students will provide patient – centered care to diverse patients using the evidence-based medicine
Pharm.D. III Year			
23	3.1	Pharmacology - II (Theory)	Upon completion of the course student shall be able to **CO.3.1.1** Identify and explain the pharmacodynamics and pharmacokinetic properties of drugs of various categories **CO.3.1.2** Recognize the adverse effects of drugs **CO.3.13** Avoid adverse drug reactions **CO.4** Recognize indications of different drugs and avoid contraindications **CO.3.1.5** Provide vital information to patients about drugs during patient counseling **CO.3.1.6** Design & execute animal experiments to identify the pharmacological properties of known drugs and unknown samples..
24	3.2	Pharmaceutical Analysis (Theory)	Upon completion of the course student shall be able to **CO.3.2.1** The importance of Quality in Pharmaceuticals. **CO.3.2.2** The students will gain appropriate knowledge about appropriate analytical skills required for the analysis of API and formulations. **CO.3.2.3** To understand the basic knowledge on assay of single and multiple component pharmaceuticals by using various analytical instruments **CO.3.2.4** To develop basic practical skills using instrumentation techniques parameters
25	3.3	Pharmacotherapeutics – II (Theory)	Upon completion of the course student shall be able to **CO.3.3.1** Students will be able to describe the pathophysiology and management of infectious, cancer, renal failure and diseases

			CO.3.3.2 Students will be developing Patient case based Assessment Skills **CO.3.3.3** Students will be able to describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of diseases **CO.3.3.4** Students will have developed clinical skills in the therapeutic management of these conditions. **CO.3.3.5** Continue to develop communication skills. **CO.3.3.6** Students will provide patient – centered care to diverse patients using the evidence based medicine
26	3.4	Pharmaceutical Jurisprudence (Theory)	Upon completion of the course student shall be able to **CO.3.4.1** Define the concepts of the pharmaceutical legislation in India **CO.3.4.2** Practice the professional ethics in pharmacy field and ethics involved in Prevention of Cruelty to animals **CO.3.4.3** Define the concepts of Drug Policy, Drug Price Control Order, Patent and Design Act, Drugs and Magic Remedies Act **CO.3.4.4** Critically interpret the various schedules involved the Drugs and Cosmetics Act, Narcotics and Psychotropic Substances Act **CO.3.4.5** Apply the basic concepts of labeling and packaging of drugs **CO.3.4.6** Define the concepts of Pharmacy Act, Medicinal and Toilet Preparation Act
27	3.5	Medicinal Chemistry (Theory)	Upon completion of the course student shall be able to **CO.3.5.1** Helps in correlating between pharmacology of a disease and its mitigation or cure. **CO.3.5.2** To understand the drug metabolic pathways, adverse effect and therapeutic value of drugs **CO.3.5.3** To know the structural activity relationship of different class of drugs. **CO.3.5.4** Well acquainted with the synthesis of some important class of drugs.

			CO.3.5.5 Knowledge about the mechanism pathways of different class of medicinal compounds. **CO.3.5.6** To understand the chemistry of drugs with respect to their pharmacological activity.
28	3.6	Pharmaceutical Formulations (Theory)	Upon completion of the subject student shall be able to **CO.3.6.1** Understand the principle involved in formulation of various pharmaceutical dosage forms; **CO.3.6.2** Prepare various pharmaceutical formulation; **CO.3.6.3** Perform evaluation of pharmaceutical dosage forms; **CO.3.6.4** Understand and appreciate the concept of bioavailability and bioequivalence, their role in clinical situations
29	3.1	Pharmacology –II (Practical)	Upon completion of the subject student shall be able to **CO.3.1.1P** Define the basic concepts of experimental pharmacology. **CO.3.1.2P** Identify the commonly used laboratory animals and apparatus in pharmacology **CO.3.1.3P** Calculate the dose and decide the route of administration of drugs. **CO.3.1.4P** Design experiments to test the safety and efficacy of experimental drugs **CO.3.1.5P** Design and execute a bioassay to determine the potency of experimental drugs
30	3.2	Pharmaceutical Analysis (Practical)	Upon completion of the subject student shall be able to **CO.3.2.1P** To understand the construction and working of various analytical instruments **CO.3.2.2P** To know principle and mechanism of instrumentation **CO.3.2.3P** To understand the different modern techniques of drug analysis

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			CO.3.2.4P To appreciate the advantages of instrumental methods of drug analysis.
31	3.3	Pharmacotherapeutics – II (Practical)	Upon completion of the subject student shall be able to **CO.3.3.1P** Writing the SOAP Note (Subjective, Objective, Assessment, Plan) for the given case. **CO.3.3.2P** Preparing Treatment Chart Review to ensure the appropriateness of medication orders. **CO.3.3.3P** Applying the Pharmacotherapeutic Treatment Guideline and its related knowledge to evaluate the health outcomes of treatment plan and services. **CO.3.3.4P** Critically evaluating and identifying the Drug Related Problems/ Adverse Drug Reactions and making appropriate therapeutic interventions. **CO.3.3.5P** Providing systematic Patient Education to the patient/caregivers on drug, disease and lifestyle related information's.
32	3.5	Medicinal Chemistry (Practical)	Upon completion of the subject student shall be able to **CO.3.5.1P** Nomenclatureofsimpleorganiccompoundsindifferentclassesandmake3DStereomodels to learn easily. **CO.3.5.2P** Determination of some important physical properties like m.pt, b.pt, solubility, etc **CO.3.5.3P** Purification of Organic compounds **CO.3.5.4P** Synthesis of organic compounds and study about principles, reactions and mechanism. **CO.3.5.5P** Synthesis of organic compounds with named reactions and study about mechanisms. **CO.3.5.6P** Systemic qualitative analysis of some unknown organic compounds
33	3.6	Pharmaceutical Formulations	Upon completion of the subject student shall be able to

		(Practical)	**CO.3.6.1P** Understand the principle involved in formulation of various pharmaceutical dosage forms; **CO.3.6.2P** Understand the practical aspects of various formulations including the cosmetics. **CO.3.6.3P** Perform evaluation of pharmaceutical dosage forms; and **CO.3.6.4P** Understand and appreciate the various calculations related to dosage forms/formulation development **CO.3.6.5P** Understand the chose the right equipment for various dosage forms
Pharm.D. IV Year			
34	4.1	Pharmacotherapeutics - III (Theory)	Upon completion of the subject student shall be able to **CO.4.1.1** Understand pathophysiology of selected disease states and the rationale for drug therapy **CO.4.1.2** Understand therapeutic approach to management of these diseases; **CO.4.1.3** Understand the controversies in drug therapy; **CO.4.1.4** Know the importance of preparation of individualised therapeutic plans based on diagnosis; **CO.4.1.4** Identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects)
35	4.2	Hospital Pharmacy (Theory)	Upon completion of the subject student shall be able to **CO.4.2.1** Know various drug distribution methods; **CO.4.2.2** Know the professional practice management skills in hospital pharmacies; **CO.4.2.3** Provide unbiased drug information to the doctors; **CO.4.2.4** Know the manufacturing practices of various Formulations in hospital set up; **CO.4.2.5** Appreciate the practice based research methods; **CO.4.2.6** Appreciate the stores management and inventory control.

36	4.3	Clinical Pharmacy (Theory)	Upon completion of the subject student shall be able to **CO.4.3.1** Monitor drug therapy of patient through medication chart review and clinical review; **CO.4.3.2** Obtain medication history interview and counsel the patients; **CO.4.3.3** Identify and resolve drug related problems; **CO.4.3.4** Detect, assess and monitor adverse drug reaction; **CO.4.3.5** Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states; **CO.4.3.6** Retrieve, analyze, interpret and formulate drug or medicine information.
37	4.4	Biostatistics & Research Methodology (Theory)	Upon completion of the subject student shall be able to **CO.4.1.1** Know the various statistical methods to solve different types of problems **CO.4.4.2** Operate various statistical software packages **CO.4.4.3** Appreciate the importance of Computer in hospital and Community Pharmacy **CO.4.4.4** Appreciate the statistical technique in solving the pharmaceutical problems
38	4.5	Biopharmaceutics & Pharmacokinetics (Theory)	Upon completion of the subject student shall be able to **CO.4.5.1** Broader understanding about the concepts of biopharmaceutics and pharmacokinetics. **CO.4.5.2** Ability to calculate the various pharmacokinetic parameters by using various mathematical models. **CO.4.5.3** Ability to design a basic protocol for the conduct of BA/BE study and the interpretation of the BA/BE data **CO.4.5.4** Preparedness to use the concepts of pharmacokinetic principles in the clinical contexts. **CO.4.5.5** Ability to design and perform *in-vitro* dissolution studies for various drugs as per the standards of official monographs **CO.4.5.6** Basic understanding about the concepts of *in-vitro - in-vivo* correlations (IVIVC)
39	4.6	Clinical Toxicology (Theory)	Upon completion of the subject student shall be able to **CO.4.6.1** Developing general working knowledge of the principles and practice of clinical toxicology **CO.4.6.2** Demonstrating an understanding of the health implications of toxic exposures and commonly involved chemicals for toxicity **CO.4.6.3** Demonstrating and applying an understanding of general toxicology principles and clinical management practice **CO.4.4.4** Demonstrating and applying an understanding of the history, assessment, and therapy considerations associated with the management of a toxic exposure

			CO.4.4.5 Demonstrating and apply an understanding of the characteristics of and treatment guidelines for specific toxic substances **CO.4.4.6** Proposing several preventive approaches to reduce unintentional poisonings **CO.4.4.7** Enabling the pharmacist to function as contributing health care team member when faced with a toxic exposure experience, including emergencies.
40	4.1	Pharmacotherapeutics - III (Practical)	Upon completion of the subject student shall be able to **CO.4.1.1P** Describe the pathophysiology and management of cardiovascular, respiratory and endocrine diseases **CO.4.1.2P** Develop the patient case-based assessment Skills **CO.4.1.3P** Describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of diseases **CO.4.1.4P** Develop clinical skills in the therapeutic management of these conditions **CO.4.1.5P** Continue to develop communication skills. **CO.4.1.6P** Students will provide patient – centered care to diverse patients using the evidence-based medicine
41	4.2	Hospital Pharmacy (Practical)	Upon completion of the subject student shall be able to **CO.4.2.1P** Define the basic concepts in Hospital pharmacy **CO.4.2.2P** Critically interpret and apply Inventory control methods **CO.4.2.3P** Execute professional responsibilities of hospital pharmacist and identify drug related problems **CO.4.2.4P** Provide professional services like patient counseling and technical inputs for parenteral nutritional support **CO.4.2.5P** Execute the activities related to hospital formulary and pharmacy and therapeutics committee

			CO.4.2.6P Able to manufacture common pharmaceutical formulations within Hospital setup
42	4.3	Clinical Pharmacy (Practical)	Upon completion of the subject student shall be able to **CO.4.3.1P** Define the role of clinical pharmacist at various healthcare settings **CO.4.3.2P** Monitor drug therapy of the patient through medication chart review and clinical review **CO.4.3.3P** Conduct the medication history interview and counsel the patients **CO.4.3.4P** Detect, assess and monitor adverse drug reactions (ADR) **CO.4.3.5P** Interpret selected laboratory results (as monitoring parameters) of specific disease states **CO.4.3.6P** Provide drug / poison information services by retrieving, analyzing, interpreting and formulate drug and medicine information by utilizing various databases and softwares.
43	4.5	Biopharmaceutics & Pharmacokinetics (Practical)	Upon completion of the subject student shall be able to **CO.4.5.1P** Define the basic concepts in biopharmaceutics and pharmacokinetics **CO.4.5.2P** Critically interpret biopharmaceutic studies including drug product equivalency **CO.4.5.3P** Use raw data and derive the pharmacokinetic models and parameters that best describe the process of drug absorption, distribution, metabolism and excretion **CO.4.5.4P** Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters **CO.4.5.5P** Identify potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R R Dist , Greater Hyderabad-501510. T.S
Ph: +91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			CO.4.5.6P Use software for various pharmacokinetic data analysis
			Pharm.D. V Year
44	5.1	Clinical Research	Upon completion of the subject student shall be able to **CO.5.1.1** Understanding of basic concepts of drug development process what it is, how it differs from standard care and why it is undertaken. Demonstrate the competencies of clinical research designs and the regulatory approval process. **CO.5.1.2** Familiarize with the various regulatory documents and the guidelines and to evaluate critical domestic and global regulatory and health care implications on the product development. **CO.5.1.3** Effectively assess and manage ethical aspects of conduct of clinical trial. **CO.5.1.4** Familiarize with the roles and responsibilities of the personnel involved in conduct of clinical research to ensure the quality research is undertaken
45	5.2	Pharmacoepidemiology &Pharmacoeconomics (Theory)	Upon completion of the subject student shall be able to **CO.5.2.1** Identify the applications of pharmacoepidemiology and pharmacoeconomics in clinical settings **CO.5.2.2** Discuss the various pharmacoepidemiological outcome measures **CO.5.2.3** Describe the concept of risk in pharmacoepidemiology and different methods of measuring risk **CO.5.2.4** Explain the various pharmacoepidemiological methods **CO.5.2.5** Explain the sources of data for pharmacoepidemiological studies **CO.5.2.6** Discuss the methods to measure outcomes in pharmacoeconomic studies **CO.5.2.7** Describe the current pharmacoeconomic evaluation methods **CO.5.2.8** Softwares used in Pharmacoepidemiology and Pharmacoeconomics Analysis.
46	5.3	Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring (Theory)	Upon completion of the subject student shall be able to **CO.5.3.1** Design the dosage regimen for the given drug based on the pharmacokinetic principles and route of administration **CO.5.3.2** Individualize the dosage regimen for the patients with altered pharmacokinetics viz renal / hepatic impairment, pediatrics, geriatrics, etc. **CO.5.3.3** Intervene the potential drug-drug interactions in a given case with appropriate recommendations for dosage adjustments **CO.5.5.4** Associate the genetic polymorphisms of the patients, if any with the clinical outcomes of the patients

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			CO.5.3.5 Formulate protocol(s) for the therapeutic drug monitoring of drug(s) and initiate the service in collaboration with other healthcare team members **CO.5.3.6** Interpret the results of therapeutic drug monitoring services of various drugs and give required recommendations for the dosage adjustment of those drugs, if required towards optimizing the treatment outcome

SREE DATTHA INSTITUTE OF PHARMACY Sheriguda

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

Sl. No.	Course code	Course name	Course outcomes statement
			M. PHARMACY
PHARMACOLOGY			
I YEAR I Semester			
1	Professional Core-I	Advanced Pharmacology – I	Upon completion of the course the student shall be able to: • Discuss the pathophysiology and pharmacotherapy of certain diseases • Explain the mechanism of drug actions at cellular and molecularlevel • Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases
2	Professional Core-II	Clinical Pharmacology and Pharmacotherapeutics	Upon completion of the course the student shall be able to understand • the pathophysiology of selected disease states and the rationale for drug therapy; • the controversies in drug therapy; • the importance of preparation of individualised therapeutic plans based on diagnosis; • needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects); • summarize the therapeutic approach to management of these diseases including reference to the latest available evidence; • Therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

			• Pathophysiology and applied Pharmacotherapeutics of diseases associated with following system diseases with of special reference to the drug of choice.
3	Professional Elective-I	Clinical Research and Pharmacovigilance	Upon completion of the course, the student shall be able to, • Explain the regulatory requirements for conducting clinicaltrial • Demonstrate the types of clinical trial designs • Explain the responsibilities of key players involved in clinical trials • Execute safety monitoring, reporting and close-out activities • Explain the principles of Pharmacovigilance • Detect new adverse drug reactions and their assessment • Perform the adverse drug reaction reporting systems and communication in pharmacovigilance
4	Professional Elective-II	Principles of Toxicology	Upon completion of the course, the student shall be able to, • Explain the various toxicologies • Explain various toxicologies of lungs, liver, gentic etc • Appreciate the importance and mechanism of skin and reproductive toxicology • Explain various mechanisms and affects of pesticides
5		Research Methodology & IPR	Upon completion of the course, the student shall be able to, Understand research problem formulation.

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			• Analyze research related information • Follow research ethics • Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity. • Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasise the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular. • Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits
6	Laboratory-I	Advanced Pharmacology - I Lab	Upon completion of the course, the student shall be able to, • Know various routes of drug administration • Learn techniques of blood sampling, anesthesia and euthanasia of experimental animals • Learn bioassay of Ach using isolated ileum/rectus abdominis muscle preparation by interpolation method, three point method and four point method.
7	Laboratory-II	Clinical Pharmacology and Pharmacotherapeutics Lab	Upon completion of the course, the student shall be able to, • Know the rational use of medicines in special population • Learn Calculation of Bioavailability and Bioequivalence • Learn Interpretation Therapeutic Drug Monitoring reports of a patient • Know the calculation of various Pharmacoeconomic outcome analysis
		I YEAR II Semester	
8	Professional Core-III	Advanced Pharmacology - II	Upon completion of the course the student shall be able to: • Explain the mechanism of drug actions at cellular and molecular level • Discuss the Pathophysiology and pharmacotherapy of certain diseases • Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

9	Professional Core-IV	Pharmacological Screening Methods and Toxicology	Upon completion of the course the student shall be able to, • Appraise the regulations and ethical requirement for the usage of experimental animals. • Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals • Describe the various newer screening methods involved in the drug discovery process • Appreciate and correlate the preclinical data to humans
10	Professional Elective-III	Pharmacoepidemiology and Pharmacoeconomics	Upon completion of this course it is expected that students shall be able to: • Understand the various epidemiological methods and their applications • Understand the fundamental principles of Pharmacoeconomics. • Identify and determine relevant cost and consequences associated with pharmacy products and services. • Perform the key Pharmacoeconomics analysis methods • Understand the Pharmacoeconomic decision analysis methods and its applications. • Describe current Pharmacoeconomic methods and issues. • Understand the applications of Pharmacoeconomics to various pharmacy settings.
11	Professional Elective-IV	Pharmaceutical Management	Upon completion of this course it is expected that students shall be able to: • Know how to manage a Pharma industry and its various departments viz QA, QC, RA, Production etc.) • Develop leadership qualities, communication &interpersonal skills, decisions making, motivation, organization &various managerial functions & professional skills required for a dynamic professional. • Understand the concept of managerial control, its levels &role, importance in pharma industry

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

12	Laboratory-III	Advanced Pharmacology – II Lab	Upon completion of this course it is expected that students shall be able to: • Record the dose response curve of Histamine using isolated guinea-pig ileum preparation • Know bioassay of Histamine using isolated guinea-pig ileum preparation by interpolation method. three point method, four point method.
13	Laboratory-IV	Pharmacological Screening Methods and Toxicology lab	Upon completion of this course it is expected that students shall be able to evaluate • Analgesic property of drug using analgesiometer • Anti-inflammatory effect of drugs using rat-paw edema method • Anticonvulsant activity of drugs using maximal electroshock and pentylenetetrazole methods. • Antidepressant activity of drugs using pole climbing apparatus and pentobarbitone induced sleeping time methods • Cardiotonic activity of drugs using isolated frog heart and mammalian heart preparations.
		II YEAR I Semester	
14	Professional Elective-V	Hospital and Community Pharmacy	Upon completion of this course it is expected that students shall be able to: • Understand the organizational structure of hospital pharmacy • Understand drug policy and drug committees • Know about procurement & drug distribution practices • Know the admixtures of radiopharmaceuticals • Understand the community pharmacy management • Know about value added services in community pharmacies
15	Open Elective	Pharmaceutical Administration	Upon completion of this course it is expected that students shall be able to • Possess interpersonal skills such as the ability to empathize and establish relationships with patients, the public and other professionals and ability to work well as part of a team. • Known about the art of time management and organizational skills, the ability to critically evaluate data and

			commercial awareness. • Know numeracy and computation; problem-solving skills and the ability to think clearly and methodically and information technology.
PHARMACEUTICS			
I YEAR I Semester			
16	Professional Core-I	Modern Pharmaceutics-I	Upon completion of this course it is expected that students shall be able to: • Explain the preformulation parameters, apply ICH guidelines and evaluate drug, drug excipients compatibility. Explain about formulation and development, use of excipients in tablets, powders, capsules, micro-encapsules and coating techniques. They also learn and apply the statistical design in different formulations.
17	Professional Core-II	Applied Biopharmaceutics and Pharmacokinetics	Upon completion of this course it is expected that students shall be able to: • Tell factors affecting the bioavailability and stability of dosage form; they also know the bioequivalence studies and protocols for bioequivalent studies. • Know the parameters for the disposition, absorption and Michaelis-Menton constants for nonlinear kinetics
18	Professional Elective-I	Total Quality Management	Upon completion of this course it is expected that students shall be able to: • Learn the established regulatory guidelines in GMP, GCP, GLP, USFDA, WHO, ISO etc to become a perfect budding pharmacist. • Acquire vast knowledge regarding the quality control aspects of different regulatory bodies as per their requirements throughout the world.
19	Professional Elective-II	Stability of Drugs and Dosage Forms	Upon completion of this course it is expected that students shall be able to: • Describe the evaluation of stability of solutions, solids and formulations against adverse conditions. • Suggest the measures to retain stability and storage conditions for retaining the efficacy of the products.
20		Research Methodology & IPR	Upon completion of the course, the student shall be able to, Understand research problem formulation. • Analyze research related information • Follow research ethics

			• Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity. • Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasise the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular. • Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits
21	Laboratory- I	Modern Pharmaceutics – I Lab	Upon completion of the course, the student shall be able to, • Learn preformulation studies of solid dosage forms. • Know the effect of compressional force on tablet disintegration time • Learn effect of particle size on dissolution of tablets • Learn determination of first order, second order rate constants by acid and alkaline hydrolysis
22	Laboratory-II	Applied Biopharmaceutics and Pharmacokinetics Lab	Upon completion of the course, the student shall be able to, • Know evaluation of drug-protein binding analysis • Learn calculation of Urinary Pharmacokinetics, Bioavailability and Bioequivalence Studies
I YEAR II Semester			
23	Professional Core-III	Modern Pharmaceutics - II	Upon completion of the course, the student shall be able to, • Understand the planning of pilot plant techniques used for all pharmaceutical dosage forms such as tablets, capsules, parenterals, aerosols, cosmetics and neutraceuticals.
24	Professional Core-IV	Advanced Drug Delivery Systems	Upon completion of the course, the student shall be able to, • Select the drugs for CDDS design of the formulation fabrication of systems of above drug delivery systems with relevant applications.
25	Professional Elective-III	Industrial Pharmacy	Upon completion of the course, the student shall be able to, • Explain the machinery involved in milling, mixing, filteration, drying and packing material constructions used in the production of pharmaceutical materials.

			• Learn salient features of GMP, TQM applicable in industry. • Understand the effluent treatments and prevent the pollution. They also should evaluate the validation of analytical methods and processes
26	Professional Elective-IV	Nano based Drug Delivery Systems	Upon completion of the course, the student shall be able to, • Select the right kind of materials, able to develop nano formulations with appropriate technologies, evaluate the product related test and for identified diseases
27	Laboratory-III	Modern Pharmaceutics – II Lab	Upon completion of the course, the student shall be able to, • Know preparation and evaluation of different creams, lotion • Know preparation and evaluation Film coated tablets, Floating tablets, Fast dissolving tablets and Chewable tablets
28	Laboratory-IV	Advanced Drug Delivery System Lab	Upon completion of the course, the student shall be able to, • Know formulation and evaluation of sustained release oral matrix tablet, sustained release oral reservoir system, microspheres / microen capsules, transdermal films, mucoadhesive system and enteric coated pellets / tablets
29	Professional Elective-V	Scale up and Technology Transfer	Upon completion of the course, the student shall be able to, • Manage the scale up process in pharmaceutical industry. • Assist in technology transfer. • To establish safety guidelines, which prevent industrial hazards
30	Open Elective	*Entrepreneurship* and management	Upon completion of the course, the student shall be able to, • Sell themselves and their ideas. Students master oral and visual presentation skills and establish a foundation of confidence in the skills necessary to cause others to act. • Find problems worth solving. Students advance their skills in customer development, customer validation, competitive analysis, and iteration while utilizing design thinking and process tools to evaluate in real-world problems and projects. • Mobilize people and resources. Students identify and secure customers, stakeholders, and team members through networks, primary customer research, and competitive and industry analyses in order to prioritize and pursue an

			initial target market in real-world projects. • Create value. Students are able to create presentations and business plans that articulate and apply financial, operational, organizational, market, and sales knowledge to identify paths to value creation through 1) company formation (for-profit); 2) social innovation (nonprofit); or 3) intellectual property licensing. • Develop and cultivate endurance. Students increase their awareness and deliberately practice the skills and disciplines necessary to increase confidence and agency; foster self-efficacy and self-advocacy; improve communication and problem-solving skills, manage strong impulses and feelings; and identify personal purpose.
PHARMACEUTICAL ANALYSIS			
I YEAR I Semester			
31	Professional Core-I	Modern Pharmaceutical Analytical Techniques	Upon completion of the course, the student shall be able to, • Apply the theories in the Analysis of various bulk drugs and their formulations. • Be in a position to apply their knowledge in developing the new methods for the determination and validate the procedures.
32	Professional Core-II	Pharmaceutical and Food Analysis	Upon completion of the course, the student shall be able to understand various analytical techniques in the determination of •Food constituents • Food additives • Finished food products • Pesticides in food • Pharmaceuticals (API & Dosage forms) • And also student shall have the knowledge on food regulations and legislations
33	Professional	Advanced Pharmaceutical	Upon completion of the course, the student shall be able to

	Elective-I	Analysis	• Understand the quantitative determination of various organic compounds. • Learn the spectral analysis, dissolution parameters and microbial assays.
34	Professional Elective-II	Stability of Drugs and Dosage forms	Upon completion of the course, the student shall be able to • Describe the evaluation of stability of solutions, solids and formulations against adverse conditions. • Suggest the measures to retain stability and storage conditions for retaining the efficacy of the products.
35		Research Methodology & IPR	Upon completion of the course, the student shall be able to, • Understand research problem formulation. • Analyze research related information • Follow research ethics • Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity. • Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasise the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular. • Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits
36	Laboratory-I	Modern Pharmaceutical Analytical Techniques lab	Upon completion of the course, the student shall be able to, • Know Calibration of glasswares, pH meter, UV-Visible spectrophotometer, FTIR spectrophotometer and HPLC instrument • Learn simultaneous estimation of multi component containing formulations by UV spectrophotometry • Learn incompatibility studies, identification and functional groups Determination by FTIR
37	Laboratory-II	Pharmaceutical and food Analysis Lab	Upon completion of the course, the student shall be able to, • Know the determination of total reducing sugar and protein • Learn determination of saponification value, Iodine value, Peroxide value, Acid value, fat content and rancidityin food products
		I YEAR II Semester	

38	Professional Core-III	Advanced Instrumental Analysis I	Upon completion of the course, the student shall be able to, • Know various spectral aspects of X-Ray, IR, SEM, ORD etc which help them in further projects works and also industrial opportunities.
39	Professional Core-IV	Modern Bio-analytical Techniques	Upon completion of the course, the student shall be able to understand • Extraction of drugs from biological samples • Separation of drugs from biological samples using different techniques • Guidelines for BA/BE studies
40	Professional Elective-III	Pharmaceutical Validation	Upon completion of the subject student shall be able to • Explain the aspect of validation • Carryout validation of manufacturing processes • Apply the knowledge of validation to instruments and equipments
41	Professional Elective-IV	Advanced Instrumental Analysis - II	Upon completion of the subject student shall be able to Know various electrochemical methods, flourimetry, AAS, RIA, ELISA etc. which help them in further projects works and also industrial opportunities
42		Research Methodology & IPR	Upon completion of the course, the student shall be able to, Understand research problem formulation. • Analyze research related information • Follow research ethics

SREE DATTHA INSTITUTE OF PHARMACY Sheriguda

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			• Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity. • Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasise the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular. • Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits
43	Laboratory-III	Advanced Instrumental Analysis I Lab	Upon completion of the course, the student shall be able to, • Determine chlorides and sulphates by Nephelo –Tubmidimetry • Test percentage of purity of official compounds by potentiometric and conductimetric titrations • Determine compounds of sodium, potassium and calcium by Flame photometry. • Estimate riboflavin/quinine sulphate by flourimetry
44	Laboratory-IV	Modern Bio analytical Techniques Lab	Upon completion of the course, the student shall be able to, • Separate biomolecules utilizing various sample preparation techniques • Analyze quantitatively components by gel electrophoresis and HPLC techniques. • Know protocol preparation and performance of bioanalytical method validation • Extract drugs and metabolites from biological matrices by SPE/LLE
II YEAR I Semester			
45	Professional Elective-V	Scale up and Technology Transfer	Upon completion of the course, the student shall be able to, Manage the scale up process in pharmaceutical industry. • Assist in technology transfer. • To establish safety guidelines, which prevent industrial hazards.

46	Open Elective	Entrepreneurships and management	Upon completion of the course, the student shall be able to, • Sell themselves and their ideas. Students master oral and visual presentation skills and establish a foundation of confidence in the skills necessary to cause others to act. • Find problems worth solving. Students advance their skills in customer development, customer validation, competitive analysis, and iteration while utilizing design thinking and process tools to evaluate in real-world problems and projects. • Mobilize people and resources. Students identify and secure customers, stakeholders, and team members through networks, primary customer research, and competitive and industry analyses in order to prioritize and pursue an initial target market in real-world projects. • Create value. Students are able to create presentations and business plans that articulate and apply financial, operational, organizational, market, and sales knowledge to identify paths to value creation through 1) company formation (for-profit); 2) social innovation (nonprofit); or 3) intellectual property licensing. • Develop and cultivate endurance. Students increase their awareness and deliberately practice the skills and disciplines necessary to increase confidence and agency; foster self-efficacy and self-advocacy; improve communication and problem-solving skills, manage strong impulses and feelings; and identify personal purpose.
PHARMACEUTICAL REGULATORY AFFAIRS			
I YEAR I Semester			
47	Professional Core-I	Good Regulatory Practice	At completion of this course it is expected that students will be able to understand • The key regulatory and compliance elements with respect to Good Manufacturing Practices, Good Laboratory Practices, Good Automated Laboratory Practices and Good Documentation Practices. • Prepare and implement the check lists and SOPs for various Good Regulatory Practices • Implement Good Regulatory Practices in the Healthcare and related Industries. • Prepare for the readiness and conduct of audits and inspections.
48	Professional Core-II	Drug Regulatory Affairs	Know the different competent regulatory authorities globally. • Aware of technical aspects pertaining to the marketing authorization application (MAA)
49	Professional Elective-I	Total Quality Management	Upon completion of this course it is expected that students shall be able to:

			• Learn the established regulatory guidelines in GMP, GCP, GLP, USFDA, WHO, ISO etc to become a perfect budding pharmacist. • Acquire vast knowledge regarding the quality control aspects of different regulatory bodies as per their requirements throughout the world.
50	Professional Elective-II	Stability of Drugs and Dosage forms	Upon completion of the course, the student shall be able to • Describe the evaluation of stability of solutions, solids and formulations against adverse conditions. • Suggest the measures to retain stability and storage conditions for retaining the efficacy of the products.
51		Research Methodology & IPR	Upon completion of the course, the student shall be able to, • Understand research problem formulation. • Analyze research related information • Follow research ethics • Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity. • Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasise the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular. • Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits
52	Laboratory-I	Regulatory Practice and Documentation Lab	Upon completion of the course, the student shall be able to • Prepare SOPs, Analytical reports (Stability and validation) • Know protocol preparation for documentation of various types of records (BMR, MFR, DR) • Know preparation of regulatory dossier as per Indian CTD format and submission in SUGAM
53	Laboratory-II	Drug Regulation and Registration Lab	Upon completion of the course, the student shall be able to • Know GMP Audit Requirements as per CDSCO • Learn preparation of checklist for registration of IND, NDA and ANDA as per ICH CTD format

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist , Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			• Learn preparation of submission to FDA, EMA and MHRA using eCTD software
		I YEAR II Semester	
54	Professional Core-III	Regulatory aspects of medical devices	Upon completion of the course, the student shall be able to know; • Basics of medical devices and IVDs, process of development, ethical and quality considerations. • Harmonization initiatives for approval and marketing of medical devices and IVDs. • Regulatory approval process for medical devices and IVDs in India, US, Canada, EU, Japan and ASEAN. • Clinical evaluation and investigation of medical devices and IVDs.
55	Professional Core-IV	Regulatory aspects of herbals and biologicals	Upon the completion of the course the student shall be able to : • Know the regulatory Requirements for Biologics and Vaccines • Understand the regulation for newly developed biologics and biosimilars • Know the pre-clinical and clinical development considerations of biologics • Understand the Regulatory Requirements of Blood and/or Its Components Including Blood Products and label requirements
56	Professional Elective-III	Nano based Drug delivery systems	Upon completion of the course, the student shall be able to, • Select the right kind of materials, able to develop nano formulations with appropriate technologies, evaluate the product related test and for identified diseases
57	Professional Elective-IV	Advanced Drug Delivery Systems	Upon completion of the course, the student shall be able to, • Select the drugs for CDDS design of the formulation fabrication of systems of above drug delivery systems with relevant applications.
58		Research Methodology & IPR	Upon completion of the course, the student shall be able to, • Understand research problem formulation. • Analyze research related information

			• Follow research ethics • Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity. • Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasise the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular. • Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits
59	Laboratory-III	Regulatory aspects of herbals and biologicals Lab	Upon completion of the course, the student shall be able to, • Know preparation of Biologics License Applications • Prepare documents required for Vaccine Product Approval • Know document required for the approval of herbal products of diverse dosage forms(3products) as per regulations requirements • Learn registration requirement comparison study in emerging markets and preparing check list for market authorization
60	Laboratory-IV	Regulatory aspects of medical devices Lab	Upon completion of the course, the student shall be able to, • Know clinical investigation plan for medical devices • Learn preparation and submission of medical devices for approval • Learn GMP of manufacturing of medical devices of diverse nature • Know preparation and submission of nutraceuticals devices for approval
			II YEAR I Semester
61	Professional Elective-V	Pharmaceutical Industry Management	Upon completion of the course, the student shall be able to • Learn validation of different process • Know validation of equipment methods • Learn effective management of waste materials
62	Open Elective	Entrepreneurships and management	Upon completion of the course, the student shall be able to,

SREE DATTHA INSTITUTE OF PHARMACY Sheriguda

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTUH, Hyderabad, T.S)
Nagarjuna Sagar Road, Sheriguda (V), Ibrahimpatnam (M), R.R.Dist., Greater Hyderabad-501510. T.S
Ph.:+91-8801099936/35, 9393808082,
Email: principalsdip@sreedattha.ac.in, www.sreedattha.ac.in

			• Sell themselves and their ideas. Students master oral and visual presentation skills and establish a foundation of confidence in the skills necessary to cause others to act. • Find problems worth solving. Students advance their skills in customer development, customer validation, competitive analysis, and iteration while utilizing design thinking and process tools to evaluate in real-world problems and projects. • Mobilize people and resources. Students identify and secure customers, stakeholders, and team members through networks, primary customer research, and competitive and industry analyses in order to prioritize and pursue an initial target market in real-world projects. • Create value. Students are able to create presentations and business plans that articulate and apply financial, operational, organizational, market, and sales knowledge to identify paths to value creation through 1) company formation (for-profit); 2) social innovation (nonprofit); or 3) intellectual property licensing. • Develop and cultivate **endurance.** Students increase their awareness and deliberately practice the skills and disciplines necessary to increase confidence and agency; foster self-efficacy and self-advocacy; improve communication and problem-solving skills, manage strong impulses and feelings; and identify personal purpose.