

**SCHEME OF INSTRUCTION & EXAMINATION WITH EFFECT FROM 2008-09 ACADEMIC YEAR**

**SCHEME OF INSTRUCTION AND EXAMINATION UNDER SEMESTER PATTERN**

Course No.	SUBJECT	Periods per week		Exam. Duration (hrs)	Marks		TOTAL
		Theory	Practical		Sessional	Semester end	
<b>III/IV B.PHARMACY 1<sup>st</sup> and 2<sup>nd</sup> SEMESTERS</b>							
101A	Mathematics (Bridge Course) (Theory)	4	---	3	20	80	100
101B	Biology (Bridge Course) (Theory)	2	---	3	20	80	100
101C	Biology (Bridge Course) (Practicals)	---	3	3	20	80	100
102	Pharmaceutical Chemistry-I (Organic-I) (Theory)	3	---	3	20	80	100
103	Pharmaceutical Chemistry-I (Practicals)	---	3	4	20	80	100
104	Physical Pharmacy-I (Theory)	3	---	3	20	80	100
105	Physical Pharmacy-I (Practicals)	---	3	4	20	80	100
106	Computer Applications and Statistical Methods.(Theory)	3		3	20	80	100
201	Pharmaceutics - I (General Pharmacy) including Dispensing (Theory)	3	---	3	20	80	100
202	Pharmaceutics - I (General Pharmacy) Practical	---	3	4	20	80	100
203	Pharmaceutical Analysis-I (Theory)	3	---	3	20	80	100
204	Pharmaceutical Analysis-I (Practicals)	---	3	4	20	80	100
205	Environmental Studies (Theory)	2	---	3	20	80	100
Total :		22	15	43	260	1040	1300

**M.P.C. STUDENTS : 1200**  
**Bi.P.C. STUDENTS : 1100**

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Course No.	SUBJECT	Periods per week		Exam. Duration (hrs)	Marks		TOTAL
		Theory	Practical		Sessional	Semester end	
<b>IIIV B.PHARMACY 3<sup>rd</sup> SEMESTER</b>							
301	Pharmaceutical Chemistry-II (Organic-II) (Theory)	6	---	3	20	80	100
302	Pharmaceutical Chemistry-II (Practicals)	---	6	4	20	80	100
303	Pharmaceutical Engineering-I (Theory)	6	---	3	20	80	100
304	Pharmaceutical Microbiology (Theory)	6	---	3	20	80	100
305	Pharmaceutical Microbiology (Practicals)	---	6	4	20	80	100
306	Anatomy & Physiology (Theory)	6	---	3	20	80	100
307	Anatomy & Physiology (Practicals)	---	6	4	20	80	100
	Total	24	18	27	160	640	800
<b>IIIV B.PHARMACY 4<sup>th</sup> SEMESTER</b>							
401	Pharmaceutical Chemistry-III (Medicinal-I) (Theory)	6	---	3	20	80	100
402	Physical Pharmacy-II (Theory)	6	---	3	20	80	100
403	Physical Pharmacy-II (Practicals)	---	6	4	20	80	100
404	Applied Biochemistry & Clinical Pathology (Theory)	6	---	3	20	80	100
405	Applied Biochemistry & Clinical Pathology (Practicals)	---	6	4	20	80	100
406	Forensic Pharmacy (Theory)	4	---	3	20	80	100
407	English & Communication Skills (Language Laboratory) (Practicals)	---	6	3	20	80	100
	Total :	22	18	20	120	480	600

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Course No.	SUBJECT	Periods per week		Exam. Duration (hrs)	Marks		TOTAL
		Theory	Practical		Sessional	Semester end	
<b>IIIIIV B.PHARMACY 5<sup>th</sup> SEMESTER</b>							
501	Pharmaceutical Chemistry-IV Medicinal-II) (Theory)	6	---	3	20	80	100
502	Pharmaceutical Chemistry-IV (Medicinal-II) Practicals	---	6	6	20	80	100
503	Pharmaceutics-II (Dosage form Technology Including Cosmetics) (Theory)	6	---	3	20	80	100
504	Pharmaceutics-II (Dosage form Technology Including Cosmetics) Practicals	---	6	6	20	80	100
505	Pharmacognosy-I (Theory)	6	---	3	20	80	100
506	Pharmacognosy-I (Practicals)	---	6	6	20	80	100
507	Pharmacology-I (Theory)	6	---	3	20	80	100
	Total	24	18	30	140	560	700
<b>IIIIIV B.PHARMACY 6<sup>th</sup> SEMESTER</b>							
601	Pharmaceutical Engineering - II (Theory)	6	---	3	20	80	100
602	Pharmaceutical Engineering-II (Practicals)	---	6	6	20	80	100
603	Pharmaceutical Biotechnology (Theory)	6	---	3	20	80	100
604	Pharmaceutical Biotechnology (Practicals)	---	6	6	20	80	100
605	Hospital and Clinical Pharmacy (Theory)	6	---	3	20	80	100
606	Hospital and Clinical Pharmacy (Practicals)	---	6	6	20	80	100
607	Seminar	6	---	---	---	---	---
	Total :	24	18	27	120	480	600

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Course No.	SUBJECT	Periods per week		Exam. Duration (hrs)	Marks		TOTAL
		Theory	Practical		Sessional	Semester end	
<b>IV/IV B.PHARMACY 7<sup>th</sup> SEMESTER</b>							
701	Pharmaceutics - III (Biopharmaceutics, (Theory) Pharmacokinetics & New Drug Delivery Systems)	6	---	3	20	80	100
702	Pharmaceutics-III (Biopharmaceutics, Pharmacokinetics & New Drug Delivery Systems) (Practicals)	---	6	6	20	80	100
703	Pharmacology-II (Theory)	6	---	3	20	80	100
704	Pharmacology-II (Practicals)	---	6	6	20	80	100
705	Pharmaceutical Analysis-II (Theory)	6	---	3	20	80	100
706	Pharmaceutical Analysis-II (Practicals)	---	6	6	20	80	100
707	Industrial Management and Pharmaceutical Marketing (Theory)	4	---	3	20	80	100
708	Project	---	2	---	---	---	---
	Total	22	20	30	140	560	700

**IV/IV B.PHARMACY 8<sup>th</sup> SEMESTER**

	Project (Contd.....)	---	6	---	---	---	100
801	Pharmaceutical Chemistry-V (Natural Products) (Theory)	6	---	3	20	80	100
802	Pharmaceutical Chemistry - V (Natural Products) (Practicals)	---	6	6	20	80	100
803	Pharmacognosy - II (Theory)	6	---	3	20	80	100
804	Pharmacognosy - II (Practicals)	---	6	6	20	80	100
805	Good Manufacturing Practices & Validation (Theory)	6	---	3	20	80	100
	Total :	18	18	21	100	400	600

## **CAREERS IN PHARMACY**

Pharmacy as a career option, which has always been in the forefront. Today sky is the limit for a pharma graduate. Depending on the qualification, talent and experience, there are numerous avenues for pharma professionals.

**Hospital Pharmacist :** Hospitals have a pharmacy department which are controlled and managed by a pharmacist. They undertake responsibility for stock control, storage, placing orders, labelling and financial budgeting and account-keeping for the dispensary.

**Retail Pharmacist :** The concept of pharma retailing is rapidly capturing the A and B class cities in India. These are organized retail chains under one banner and thus this calls for a good number of pharmacists to handle the entire show.

**Drug Inspectors :** They are employed by the state governments and they look after the day-today affairs of the pharma business. The job of a drug inspector includes the inspection of establishment where drugs, cosmetics, and medical devices are manufactured, handled, stored or sold to enforce legal standards of purity and grading.

**Analytical Chemist :** These are employed by labs which provides testing and validation about the pharma and related products.

**Manufacturing Chemist :** With a tremendous growth in the number of manufacturing units the demand for pharmacists is right on the top. Apart from the pharmaceutical units manufacturing chemists are also employed by allied industries such as nutraceuticals, food, cosmetics etc. The job involves to preparation of a pilot sample and see that production of a particular formulation line is right from the raw material to the end of packaging.

**Medical Representatives :** These are sales people who are brand ambassador for their respective companies (both national and multinational companies).

**Research and Development :** With India becoming a hub of R & D, this sector always looks at for the right pharma professionals. Further many more MNC's have made India as a hub for their R and D. The areas of research includes New Drug Discovery Research (NDDR), Process Development (P & D); Formulation & Development, (F&D) standardization of dosage etc.

**Clinical Research :** With many CRO's operations in India, clinical research is an industry itself. India is becoming a hub for clinical research; the demand for professionals in this field is growing rapidly. Clinical research business in India will be worth \$1 billion by 2010. Thus, there will soon be a massive demand for clinical research professionals, making it an interesting career option with massive growth potential.

**Product Management :** Managing a brand is the responsibility of product management department. Pharma professionals enjoy an added advantage over scores others in terms of suitability for this job.

**Medical Transcription :** Medical transcription could be one of the speedy growing IT-enabled service in India also, with the rapid change in the outlook, of Indian healthcare and privatization of the insurance sector.

**Pharma Publishing :** This is becoming new entrepreneurship business for pharma professionals. This involves publishing of pharma magazine/ News letters related to pharmacy topics.

**Drug Regulatory :** With the Indian companies going globally the role of drug regulatory department is increasing day-by-day. The job involves the preparation of drug dossier and its registration in other countries. Further knowledge of exports and imports also becomes handy in such cases. The job also involves travelling abroad for licensing and alliances.

**Academics :** With many colleges mushrooming all over India, teaching is a good option for those interested in academics. As per the A.I.C.T.E. norms the minimum entry-level qualification as lecturer is M.Pharma. This is a profession associated with job satisfaction and social status as teaching is considered to be noble profession. The higher posts in the hierarchy are Sr.Lecturer, Reader, Asst. Professor, Professor, Principal etc. The emoluments are satisfactory. Besides teaching academic-related opportunities involve positions on research posts and training programs.

**SECTION - II**  
**AIMS AND OBJECTIVES OF B.PHARM COURSE**

**Aims :**

Pharmacy graduates are required to learn and acquire adequate knowledge, necessary skills to practice the profession of pharmacy including thorough and exhaustive knowledge of synthesis and assay of Medicinal agents including mode of action, drug interactions and patient counseling and professional information exchange with Physicians and other paramedicos. The graduates are required to acquire an in-depth knowledge of formulation, storage and analysis of various pharmaceutical dosage forms including herbal medicines required for both large scale commercial production & research. The graduates should understand the concept of Community Pharmacy and be able to participate in rural and urban health care projects of State and Central government. The graduate is also required to detail the physicians and community and market the medicinal agents for diagnosis, prevention and therapeutic purposes. The pharmacist should act as bridge between Physicians and Patients and strive for better health care.

**Objectives :**

**The objectives are covered under three headings namely :**

- a. Knowledge and understanding
- b. Skills and
- c. Attitude

**A. KNOWLEDGE & UNDERSTANDING :**

**The graduate should acquire the following during their four-year**

**B.Pharm course**

1. Adequate knowledge and scientific information regarding basic principles of Pharmaceutical chemistry, Pharmaceutics including cosmetics, Pharmacology and Pharmacognosy including Herbal drugs.
2. Adequate knowledge of practical aspects of synthesis, formulation and analysis of various pharmaceutical and Herbal medicinal agents.
3. Adequate knowledge of practical aspects of delivering a quality assured product as per pharmacopoeia, WHO and ISO standards.
4. Adequate knowledge of practical aspects of Pharmacological screening, biological standardization and *in-vivo* drug interactions.
5. Adequate knowledge of clinical studies for patient counseling leading to physical and social well being of patients.
6. Adequate knowledge of practical aspects of product detailing and marketing of Pharmaceutical products.

**B. SKILLS :**

**A graduate should be able to demonstrate the following skills necessary for practice of a pharmacy.**

1. Able to synthesize, purify, identify and analyze medicinal agents.
2. Able to formulate, store, dispense, analyze the prescriptions and/or manufacture the medicinal agents at commercial level.
3. Able to learn and apply the quality assurance principles including legal and ethical aspects involving drugs.
4. Able to extract, purify, identify and know the therapeutic value of herbal/crude/natural products.
5. Able to screen various medicinal agents using animal models for pharmacological activity.

**C. ATTITUDES :**

**The graduate should develop the following attitudes during their four-year B.Pharm course.**

1. Willing to apply the current knowledge of Pharmacy in the best interest of patients and the community.
2. Maintain a high standard of professional ethics in discharging professional obligations.
3. Continuously upgrade professional information and be conversant with latest advances in pharmacy field to serve the community better.
4. Willing to participate in continuing education programmes of PCI and AICTE to upgrade knowledge and professional skills.
5. To help and to participate in the implementation of National Health Programmes.



## **REGULATIONS**

### **01 Eligibility criteria for admission :**

- 1.1 Candidates for admission to the degree in Bachelor of Pharmacy (B.Pharmacy) course shall be required to have passed.
- (i) The Intermediate (10 + 2) Examination of the Board of Intermediate Education, Government of Andhra Pradesh or an Examination recognised as equivalent there to with Physics, Chemistry and Mathematics or Biology as subjects.
- (OR)
- (ii) The Diploma in Pharmacy (other than vocational) from an Institution in Andhra Pradesh recognised by the Pharmacy Council of India or a Resident of Andhra Pradesh with a Diploma in Pharmacy from outside Andhra Pradesh.
- 1.2 Admission into first year B. Pharmacy course will be decided based on EAMCET Score for Intermediate candidates and on the rank or mark obtained in the Entrance Test for Diploma candidates.
- 1.3 Diploma in Pharmacy candidates may be admitted upto 10% of the seats permitted and the remaining seats are to be allocated to Intermediate M.P.C. and Bi.P.C. candidates in the ratio 1 : 1.
- 1.4 Reservation for admissions will be as per the Government Rules.

### **02 Duration of the Course :**

The degree of Bachelor of Pharmacy will be conferred on the candidate who have subsequently undergone the prescribed course of study of the Acharya Nagarjuna University for a period of four academic years and three academic years for those admitted to II B.Pharmacy directly. The course of study is as prescribed under scheme of instruction and syllabus.

### **03. Academic Work :**

- i Instruction and Examination in each academic year is spread over two semesters with a minimum of 90 working days in each semester (180 days in any given academic year). However in the case of semester I and II of B.Pharmacy the instruction and examination shall be organized simultaneously spread over the entire academic year of 180 days to save time that may be lost due to possible delay in the admission process.
- ii Each period of instruction is of 50 minutes. Seven periods of instruction are provided on each day and there are six working days in a week (Monday to Saturday)

**04. Attendance Requirements :** A regular course of study during an academic semester means a minimum of average attendance of 75% of all the courses of the semester computed by totaling the number of periods of lectures and practicals, as the case may be, held in every course. In special cases where sufficient causes were shown, the Vice-Chancellor may on the recommendation of the principal concerned condone the deficiency in the average attendance to an extent of 10% for reasons such as ill health, if the application for condonation is submitted at the time of actual illness and is supported by certificate of authorized Medical Officer approved by the Principal. However, in the case of students, who participate in activities like N.S.S., N.C.C., Inter-Collegiate tournaments conducted by Acharya Nagarjuna University, Inter-University tournaments conducted by Inter-University Board and any such other activities involving the representation of the College/ University with the prior approval of the principal, the candidate may be deemed to have attended the college during the period solely for the purpose of the examination.

- i. A candidate who cannot satisfy the attendance requirements in clause 05 because of late admission under special circumstances reasonable and acceptable to the University on the basis of document, shall fulfill the following conditions: Average attendance : A candidate shall have attended at least a total of 90% of the periods-lectures/practicals as the case may be held from the date of admission and also shall attend at least 50% of the total working days during that academic semester (Late admission means, admissions made after 45 days from date of commencement of the academic semester for the course).
- ii. If any candidate fails to satisfy the regulation under 05 or 06 she/he shall not be allowed for the university Examinations at the end of the semester, and he/she shall not be allowed for promotion to the next higher class of study. He/she shall be required to repeat the regular course of study of that academic semester along with the next regular batch.

**05. Examinations :** Assessment for the award of degree shall consists of

- (a) Internal evaluation for 20 marks in each of the theory and practical courses separately as detailed in the scheme of examination.
- (b) Semester-end examination as detailed in the scheme of examination for 80 marks in each of the theory and practical.

- i. Regulations concerning sessional examination:** (a) There shall be two sessional examinations in each theory course and the best of the two shall be taken; (b) The marks for the internal evaluation for the practical are awarded based on the continuous assessment of the performance of the candidate at the practical classes and the records. The marks certificate issued to the candidate by University shall show separately the sessional marks, the semester-end examination marks and the aggregate of both; (c) The teacher who teaches the subject shall ordinarily be internal examiner; (d) There shall be no provision for the improvement of the sessional marks.
- ii. Regulations concerning semester-end examination:** (a) There shall be one semester-end examination in each theory course based on the question paper set by an external paper setter and it shall be evaluated by an internal examiner. There shall be one semester-end examination in each practical course and the one external. The duration of the practical examination may be of 4 to 6 hours as prescribed. There shall be no supplementary examination except for the final semester-end examinations. A candidate shall not be allowed to appear for the sixth semester end examination unless he passes in all the courses of the first and second semester end examinations and the eighth semester-end examinations unless he passes in all the courses of the third and fourth semester-end examinations.
- iii. A candidate shall be declared to have passed the examination in each semester if he obtains (i) not less than 40% marks in each theory and 40% in each practical of the semester-end examinations.
- iv. A candidate may be permitted to improve his performance in semester-end examination of any semester only after completing the entire eight semester course of study by appearing again for the whole examinations of that semester only during four subsequent years after completion of the study of the entire course. Such an improvement can be availed only once for each one of the semester examinations of the entire course of study. When considered in its totality the better of the two performances as whole at the I, II, III, IV, V, VI, VII or VIII semesters as the case may be shall be taken into consideration for the purpose of awarding the grade.
- v. The courses 101 (A) Mathematics, 101 (B) Biology Theory and 101 (C) Biology Practicals are bridge courses for candidates with only biology and with only mathematics background respectively at the intermediate level.

- vi. Any candidate who carried a backlog at any stage will not be eligible for rank, medal or prizes to be awarded by the University. First attempt means appearance at the first examinations conducted for the particular batch.

**06. Industrial Training :**

Every candidate shall undergo practical training for at least one month in pharmaceutical factory/Pharmaceutical concern / hospital / clinical lab at the end of the final semester of the course.

**07. Industrial Tour :**

Candidates studying in final year of the course shall visit several Pharmaceutical manufacturing houses as a supplement to their academic training and submit a report to the satisfaction of the Head of the institution where he/she has studied.