

# NORTH MAHARASHTRA UNIVERSITY, JALGAON

## Pre-Ph.D.Syllabus for Paper-II

### Advances in Pharmaceutical Sciences

**Pharmaceutical Analysis :** UV- Visible spectroscopy: Introduction, origin and Theory of Spectra instrumentation, interaction with EMR, characteristic absorption spectra of organic compounds, derivative spectroscopy, Solvent effects, Pharmaceutical applications.

Infra-Red Spectroscopy: Introduction, origin and Theory of Spectra instrumentation, Sample Handling, absorption of Common Functional groups, interpretation of spectra, Recent Advances in IR spectroscopy.

Chromatography: Basic Principle instrumentation, Methodological Techniques and Quantitative Analysis of drugs and their Metabolites using Column, Paper chromatography, TLC, Ion-exchange chromatography, GC, HPLC and HPTLC.

Statistical Analysis Design of Experiments and Data collection, Analysis of Data collected and interpretation of the Analysis ('T' Test, 'F' Test, Chi-square Test), Statistics in Biological Testing.

**Computer aided drugs design:** A brief introduction of CADD and their application in designing of molecules.

**Drug Regulatory Affairs:** Indian Patent Act 1970, its amendments, concepts of IPR, criteria for granting patents and filing a Indian patent, PCT, Patent infringement. INDA/NDA/ANDA filing. Para I, II, III, IV filing. Hatch-Waxman amendments. Introduction to Patent Search. OECD guidelines for chemical testing pertaining to use as drug, related substances, excipients, toxicity, etc. WHO guidelines for standardization of raw material and finished products including herbal products.

**Natural Products :** Pharmacognosy and Phytochemistry – Chemistry, tests, isolation, characterization and estimation of phytopharmaceuticals belonging to the group of Alkaloids, Glycosides, terpenoids, Steroids, Bioflavonoids, Purines, Guggul lipids. Pharmacognosy of crude drugs that contain the above constituents. Standardization of raw materials and herbal products. WHO guidelines. Quantitative microscopy including modern techniques used for evaluation. Biotechnological principles and techniques for plant development, Tissue culture.

**Pharmacology :** General pharmacological principles including Toxicology. Drug interaction. Pharmacology of drugs acting on Central nervous system, Cardiovascular system, Autonomic nervous system, Gastrointestinal system and Respiratory system. Pharmacology of

pdfMachine - is a pdf writer that produces quality PDF files with ease!

Get yours now!

"Thank you very much! I can use Acrobat Distiller or the Acrobat PDFWriter but I consider your product a lot easier to use and much preferable to Adobe's" A.Sarras - USA

Autocoids, Hormones, Hormone antagonists, chemotherapeutic agents including anticancer drugs. Bioassays, Immuno Pharmacology. Drugs acting on the blood and blood forming organs. Drugs acting on the renal system.

**Medicinal Chemistry :** Structure, nomenclature, classification, synthesis, SAR and metabolism of the following category of drugs, which are official in Indian Pharmacopoeia and British Pharmacopoeia. Introduction to drug design. Stereochemistry of drug molecules. Hypnotics and Sedatives, Analgesics, NSAIDS. Neuroleptics, Antidepressants, Anxiolytics, Anticonvulsants, Antihistaminics, Local Anaesthetics, Cardio Vascular drugs – Antianginal agents Vasodilator, Adrenergic and Cholinergic drugs, Cardiotoxic agents, Diuretics, Antihypertensive drugs, Hypoglycemic agents, Antilipidemic agents, Coagulants, Anticoagulants, Antiplatelet agents. Chemotherapeutic agents – Antibiotics, Antibacterials, Sulphadiazine. Antiprotozoal drugs, Antiviral, Antitubercular, Antimalarial, Anticancer, Antiamoebic drugs. Diagnostic agents. Preparation and storage and uses of official Radiopharmaceuticals, Vitamins and Hormones. Eicosanoids and their application.

**Pharmaceutics :** Formulation and Evaluation of tablets, capsules, liquids, semisolid, ophthalmic and parenteral preparations. Stability testing of pharmaceutical dosage form as per ICH guidelines. Biopharmaceutics and Pharmacokinetics and their importance in formulation. Formulation and characterization of cosmetics – lipstick, shampoo, creams, nail preparations and dentifrices and Pharmaceutical calculations.

**Pharmaceutical Jurisprudence :** Drugs and cosmetics Act and rules with respect to manufacture sales and storage. Pharmacy Act, Pharmaceutical ethics.

**Biochemistry :** Biochemical role of hormones, Vitamins, Enzymes, Nucleic acids, Bioenergetics, General principles of immunology. Immunological, Metabolism of carbohydrate, lipids, proteins, Methods to determine, kidney & liver function. Lipid profiles.

**Microbiology :** Principles and methods of microbiological assays of the Pharmacopoeia. Methods of preparation of official sera and vaccines. Serological and diagnostics tests. Applications of microorganisms in Bio Conversions and in Pharmaceutical industry.

**Clinical Pharmacy :** Therapeutic Drug Monitoring Dosage regimen in Pregnancy and Lactation, Pediatrics and Geriatrics. Renal and hepatic impairment. Drug – Drug interactions and Drug – food interactions, Adverse Drug reactions. Medication history, interview and Patient counselling.

**pdfMachine - is a pdf writer that produces quality PDF files with ease!**

**Get yours now!**

"Thank you very much! I can use Acrobat Distiller or the Acrobat PDFWriter but I consider your product a lot easier to use and much preferable to Adobe's" A.Sarras - USA

## BOOK RECOMMENDED

A Owunwonne, Handbook of Radiopharmaceuticals, Narosa Publishing House, New Delhi.

Ansel H C, Introduction to Pharmaceutical Dosage Forms, K M Varghese & Co., Bombay.

Aulton M E Pharmaceutics - The Science of Dosage Form Design, ELBS/ Churchill Livingstone.

Avis K E, Lachman L and Lieberman H A, Marcel Dekker Inc. Pharmaceutical Dosage Forms; Parenteral Medications, Vols. 1& 2, NY.

Badger W L and Banchemo J T, Introduction to Chemical Engineering McGraw Hill International Book Co., London.

Remington's The science and Practice of Pharmacy, Mack Publishing Co. Easton, Pennsylvania.

Hassan William E, Hospital Pharmacy, Lea & Febiger, Philadelphia.

Jain N K A Text Book of Forensic Pharmacy, Vallabh Prakashan, Delhi.

Lieberman H A. Rieger M M and Banker G S, "Pharmaceutical Dosage Forms; Dispense Systems, Vols. 1 & 2, Marcel Dekker Inc., NY.

Lieberman H A, Lachman L & Schwartz J B Pharmaceutical Dosage Forms.: Tablets, 'Vols. 1-3, Marcel Dekker Inc., NY.

Martin A N, Arthur Cammarata, James Swarbrick, Physical Pharmacy, K M Varghese & Co., Bombay.

Martin E. W. Dispensing of Medication, Mack Publishing Co., Eastern P A. Martindale: The Extra Pharmacopoeia, ed J E F Reynolds, The Pharmaceutical Press, London.

Merchant H.S and Qadry J. S, Text Book of Hospital Pharmacy, B.S. Shah Prakashan, Ahmedabad.

Brain K R and Turner T D, The Practical Evaluation of Phyto pharmaceuticals, Wright - Scientechica, Bristol.

Chadha K L and Gupta R Advances in Horticulture-Vol. II-Medicinal and Aromatic Plants, Malhotra Publishing House, New Delhi.

Chopra R N, Nayar S L and Chopra, I C, Glossary of Indian Medicinal Plants, C SIR, New Delhi.

De Mayo P, The Chemistry of Natural Products, 2-3, Interscience, New York

**pdfMachine - is a pdf writer that produces quality PDF files with ease!**

**Get yours now!**

"Thank you very much! I can use Acrobat Distiller or the Acrobat PDFWriter but I consider your product a lot easier to use and much preferable to Adobe's" A.Sarras - USA

Henry T A, The Plant Alkaloids, McGraw Hill, New York.

Kokate C K, Practical Pharmacognosy, Vallabh Prakashan, Delhi.

Kokate C K, Purohit A P and Gokhale S B, Pharmacognosy (Degree) Nirali Prakashan, Pune.

Manitto P, The Biosynthesis of Natural Products, Ellis Horwood, Chichester. Manske R H F, The Alkaloids, Academic Press, New York.

Martindale, The Extra Pharmacopoeia, Pharmaceutical Society of Great Britain, London.

The Wealth of India, Raw Materials (all volumes) Council of Scientific and Industrial Research, New Delhi.

Trease G E and Evans W C, Pharmacognosy, Bailliere Tindall, Eastbourne, U K. Tyler V C., Brady, L R., and Robers J E., Pharmacognosy, Lea and Febiger, Philadelphia.

Tyler VE Jr and Schwarting AE., Experimental Pharmacognosy, Burgess Pub. Co, Minneapolis, Minnesota.

United States Pharmacopoeia, United States Pharmacopoeial Convention Inc., Rockville Meddisson.

Wallis T E, Analytical Microscopy, J & A Churchill limited, London.

Wallis T E., Text Book of Pharmacognosy , J & A Churchill Limited, London.

Welsch J R, Fundamentals of Plant Genetics and Breeding, Wiley, New York.

Whistler R L., Industrial. Gums, Polysaccharides and their Derivatives, Academic Press, New York.

Williams S., Official Methods of Analysis, Association of Official Analytical Chemists Inc., Arlington, Virginia, USA.

Zafar R, Medicinal Plants of India, c. B.S. Publisher, New Delhi.

Applied Therapeutics: The Clinical Use of Drugs, Applied Therapeutics, Inc.

Barar F S K., Text Book of Pharmacology, Interprint, new Delhi.

Best and Taylor's Physiological Basis of Medical Practice, Willium & Wilkins, Baltimore.

Chaurasia B D, Human Anatomy, Regional & Applied. Part I, II & III, CBS Publishers and Distributors, New Delhi.

Guyton A C, Hall JE., Textbook of Medical Physiology, WB Sannders Company. Herfindal E T and Hirschman J L., Clinical Pharmacy and Therapeutics. Williams and Wilkins.

**pdfMachine - is a pdf writer that produces quality PDF files with ease!**

**Get yours now!**

"Thank you very much! I can use Acrobat Distiller or the Acrobat PDFWriter but I consider your product a lot easier to use and much preferable to Adobe's" A.Sarras - USA

Human Physiology, C C Chatterjee, Medical Allied Agency, Calcutta.

Human Physiology, Subhash Shalya, CBS Publishers & Distributors.

Katzung, B G., Basic and Clinical Pharmacology, Prentice Hall, International.

Keele C A, Neil E and Joels N, Samson Wright's Applied Physiology, Oxford University Press.

Kulkarni S.K., Handbook of Experimentals Pharmacology, Vallabh Prakashan Delhi.

Parmer N .S, Health Education and Community Pharmacy, CBS Publishers.

Tortora G J, and Anagnodokos N P, Principles of Anatomy and Physiology Harper & Row Publishers N. Y.

Theoharides T C, Pharmacology, Little Brown and Co ..

Vander A J, Shermati J H and Luciano D S Human Physiology, Tata McGraw Hill Publishing Co., New Delhi.

Acheson R N, An Introduction to the Chemistry of Heterocyclic Compounds, Interscience Publishers, New York.

Atherden L M, Bentley and Driver's Text book of Pharmaceutical Chemistry, Oxford University Press, London.

Bassett J, Denny R C, Jeffery G H, Mendham J, Vogel's Textbook of Quantitative Inorganic Analysis, ELBS/Longman, London.

Beckett A H and Stenlake J B, Practical Pharmaceutical Chemistry Vol. I and II., The Athlone Press of the University of London.

Finar I L, Organic Chemistry, Vol. II ELBS/Longman, London. Foye W C, Principles of Medicinal Chemistry, Lea & Febiger, Philadelphia. Furniss B S, Hannaford A J, Smith P W G and Tatehell A R, Vogel's Textbook of Practical Organic Chemistry, The ELBS/Longman, London.

Knevel A M and Digangi F E, Jenkin's Quantitative Pharmaceutical Chemistry, McGraw Hill Book Co., New York.

Laidler K J, Physical Chemistry with Biological Applications, Benjman.

Lehninger A L, Biochemistry, Worth Publisher, Inc., Lehninger A L, Principles of Biochemistry, CBS Publishers and Distributors.

Martin D W, Mays P A and Redwell V M, Harpers Biochemistry, Lange Medical Publications.

Mussay RK, Granner DK, Mayos PA and Rodwell Harpers Biochemistry, Prentice-Hall

**pdfMachine - is a pdf writer that produces quality PDF files with ease!**

**Get yours now!**

"Thank you very much! I can use Acrobat Distiller or the Acrobat PDFWriter but I consider your product a lot easier to use and much preferable to Adobe's" A.Sarras - USA

International, Inc.

Nogrady T, Medicinal Chemistry-A Biochemical Approach, Oxford University Press, New York, Oxford.

Shoemaker D P, Garland C W, Experiments in Physical Chemistry, McGraw Hill Book Co., New York.

Wolff M E, Ed. Burger's Medicinal Chemistry, John Wiley & Sons, New York. Williams V R and Williams H S, Basic Physical Chemistry for the Life Sciences, W H Freeman.

Daniel W W, Biostatistics. A Foundation for Analysis in Health Sciences, John Wiley, NY.

Gupta S P, Statistical Methods, Sultan Chand & Co., New Delhi.

**pdfMachine - is a pdf writer that produces quality PDF files with ease!**

**Get yours now!**

"Thank you very much! I can use Acrobat Distiller or the Acrobat PDFWriter but I consider your product a lot easier to use and much preferable to Adobe's" A.Sarras - USA