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**R15**
**B.Pharm IV-II Semester**

S. No.	Course Code	Subject	L	T	P	C
1.	15R00801	<b>MOOCS -II</b> (Biostatistics and Design of Experiments) / <b>Conventional/ Self study</b>	3	1	-	3
2.	15R00802	<b>MOOCS - III</b> ( Intellectual Property Rights) / / <b>Conventional/ Self study</b>	3	1	-	3
3.	15R00803	Comprehensive viva voice	-	-	4	2
4.	15R00804	Technical Seminar	-	-	4	2
5.	15R00805	Project Work	-	-	24	13
<b>Total:</b>			06	02	32	23

**R15****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**

<b>Subject</b>	<b>MOOCS -II (Biostatistics and Design of Experiments) / Conventional/ Self study</b>	<b>Code</b>	<b>15R00801</b>
<b>Course Year</b>	<b>B.Pharmacy IV year</b>	<b>Sem</b>	<b>II</b>
<b>Lab</b>	<b>3hrs/week</b>	<b>Tutorial</b>	<b>1hr/week</b>
<b>End exam</b>	<b>70 Marks</b>	<b>Internal exam</b>	<b>30 Marks</b>
<b>Credits</b>	<b>3</b>		

**SCOPE:** Biostatistics is the application of statistics to different topics in biology including medicine, pharmacy, public health science, agriculture and fishery. It involves the analysis of data from experiments; its interpretation and drawing conclusion from the results. It involves the application of statistical theory to real-world problems, the practice of designing and conducting biomedical experiments and clinical trials. Design of experiments is planning experimental strategy, screening a large number of parameters and selecting the important ones, determining the minimum number of experiments and deciding on the mode and manner in which experiment have to be conducted. The course encompasses topics such as distribution of data, sample size, tests of significance, data reduction, regression analysis, comparison of performance of drugs in clinical trials, design of experiments, screening and second order designs.

**UNIT I**

Introduction to Statistics

Various Distributions: Normal Distribution, sample and Population, Z distribution.

**UNIT II**

Test of Significance, t- test, F test, ANOVA.

**UNIT III**

2 test/odds ratio, Non-Parametric test, other tests.

**UNIT IV**

Design of Experiments: Introduction to design of experiments, screening designs – Data Analysis.

**UNIT V**

Higher order Designs - Data analysis

Regression Analysis – Data reduction

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**R15****REFERENCES:**

1. 'Biostatistics', KS Negi, AITB Publishers, Delhi.
2. 'Fundamentals of Biostatistics', Irfan Ali Khan, Ukaaz Publications
3. 'Biostatistics for Pharmacy', Khan and Khanum, Ukaaz Publications
4. 'Basic statistics and Pharmaceutical applications', J.E, Demuth, Mercel & Dekker.
5. 'Applied statistics' by S.C.Gupta & V.K.Kapoor
6. 'Fundamentals of mathematical statistics' by S.C.Gupta & V.K.Kapoor

**NPTEL:** <http://nptel.ac.in/courses/102106051/>

**R15**
**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**

<b>Subject</b>	<b>MOOCS – III (Intellectual Property Rights) / /Conventional/ Self study</b>	<b>Code</b>	<b>15R00802</b>
<b>Course Year</b>	<b>B.Pharmacy IV year</b>	<b>Sem</b>	<b>II</b>
<b>Lab</b>	<b>3hrs/week</b>	<b>Tutorial</b>	<b>1 hr/week</b>
<b>End exam</b>	<b>70 Marks</b>	<b>Internal exam</b>	<b>30 Marks</b>
<b>Credits</b>	<b>3</b>		

**SCOPE:** The course is designed to introduce fundamental aspects of Intellectual property Rights to students who are going to play a major role in development and management of innovative projects in industries. The course introduces all aspects of the IPR Acts. It also includes case studies to demonstrate the application of the legal concepts in Science, Engineering, Technology and Creative Design.

**UNIT I**
**OVERVIEW OF INTELLECTUAL PROPERTY**

Introduction and the need for intellectual property right (IPR), IPR in India – Genesis and Development, IPR in abroad, Some important examples of IPR

**UNIT II**
**PATENTS AND UTILITY MODELS**

**PATENTS:** Patent document, searching a patent, Drafting of a patent, Filing of a patent Macro-economic impact of the patent system, Patent and kind of inventions protected by a patent, Granting of patent, Rights of a patent Protecting your inventions – extension in patent protection The different layers of the international patent system (national, regional and international options)

**UTILITY MODELS:** Differences between a utility model and a patent, Trade secrets and know-how agreements.

**UNIT III**
**COPYRIGHTS, TRADEMARKS AND GEOGRAPHICAL INDICATIONS**

**COPYRIGHTS:** Copyright, things covered by copyright, period of copyright, Rights covered by copyrights and protection of copyrights.

**RELATED RIGHTS:** Related rights, Distinction between related rights and copyright

**TRADEMARKS:** Trademark –Rights, kind of signs, types and function of trademarks Registration, period, extension and protection of trademark.Well-known marks and their protection, Domain name and its relation to trademarks.

**R15****GEOGRAPHICAL INDICATIONS**

Geographical indication - its protection, reasons for protection

**UNIT IV****INDUSTRIAL DESIGNS AND NEW PLANT VARIETIES**

**INDUSTRIAL DESIGNS:** Protection, kinds of protection, needs for protection

**NEW PLANT VARIETIES:** New varieties of plants – protection and extension

Breeder – Rights and protection

**UNIT V****UNFAIR COMPETITION AND ENFORCEMENT OF INTELLECTUAL PROPERTY**

**RIGHTS UNFAIR COMPETITION:** Unfair competition, Relationship between unfair competition and intellectual property laws.

**ENFORCEMENT OF INTELLECTUAL PROPERTY RIGHTS:** Infringement of intellectual property rights, Enforcement Measures and Emerging Issues in Science and technologies.

Overview of Biotechnology and Intellectual Property Rights in Biotechnology Research. Management - Licensing and Enforcing Intellectual Property, Commercializing Biotechnology Invention and Case studies of Biotechnology. Case studies of patents in other areas – Pharmaceutical Research

**TEXT BOOKS**

1. T. M Murray and M.J. Mehlman, Encyclopedia of Ethical, Legal and Policy issues in Biotechnology, John Wiley & Sons 2000

**REFERENCES**

1. P.N. Cheremisinoff, R.P. Ouellette and R.M. Bartholomew, Biotechnology Applications and Research, Technomic Publishing Co., Inc. USA, 1985
2. D. Balasubramaniam, C.F.A. Bryce, K. Dharmalingam, J. Green and K. Jayaraman, Concepts in Biotechnology, University Press (Orient Longman Ltd.), 2002
3. Bourgagaize, Jewell and Buiser, Biotechnology: Demystifying the Concepts, Wesley Longman, USA, 2000.
4. AjitParulekar and Sarita D' Souza, Indian Patents Law – Legal & Business Implications; Macmillan India Ltd , 2006.
5. B.L.Wadehra; Law Relating to Patents, Trade Marks, Copyright, Designs & Geographical Indications; Universal law Publishing Pvt. Ltd., India 2000
6. P. Narayanan; Law of Copyright and Industrial Designs; Eastern law House, Delhi , 2010

**NPTEL:** <http://nptel.ac.in/syllabus/syllabus.php?subjectId=110999906>