UNIVERSITY OF MUMBAI
No. UG/239 of 2016-17

CIRCULAR:-

The Principals of the affiliated Colleges in Arts, Science & Commerce and the Heads of recognized Institutions concerned are hereby informed that the recommendation made by Ad-hoc Board of Studies in Pharmacy at its meeting held on 30th May, 2016 has been accepted by the Academic Council at its meeting held on 24th June, 2016 **vide** item No. 4.65 and subsequently approved by the Management Council at its meeting held on 18th November, 2016 **vide** item No.29 and that in accordance therewith, in exercise of the powers conferred upon the Management Council under Section 54 (1) and 55 (1) of the Maharashtra Universities Act, 1994 and the Ordinances 6344 and 6345 and Regulations 9065, 9066 and 9067and the syllabus as per the (CBCS) for the F.Y., S.Y. & T.Y. B. Voc. (Pharma Analytical Sciences (Sem. I to VI), has been introduced, which is available on the University's web site (www.mu.ac.in) and that the same has been brought into force with effect from the academic year 2016-17.

MUMBAI – 400 032
27th January, 2017

(Dr.M.A.Khan)
REGISTRAR

To,
The Principals of the affiliated Colleges Arts, Science & Commerce and the Heads of Recognized Institutions concerned.

A.C/4.65/24/06/2016
M.C/29/18/11/2016

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No. UG/239-A of 2016 MUMBAI-400 032 27th January, 2017

Copy forwarded with Compliments for information to:-

1) The Ordinator, Faculties of Arts, Science & Commerce,
2) The Professor-cum-Director, Institute of Distance & Open Learning (IDOL)
3) The Director, Board of College and University Development,
4) The Co-Ordinator, University Computerization Centre,
5) The Controller of Examinations.

(Dr.M.A.Khan)
REGISTRAR

PTO…

AC 24-06-2016
Item No. 4.65

UNIVERSITY OF MUMBAI

Syllabus for the F.Y., S.Y. and T.Y. B.Voc

Program: B.Voc

Course : PHARMA ANALYTICAL SCIENCES

(To be Introduced Choice Based Credit System with effect from the academic year 2016-17)

Preamble:

Indian Pharmaceutical industry:

India accounts for 7% of the GDP by chemical sector and 11% of the national export. There are about 20000 registered pharmaceutical units in India and there are about 250 large units, 8000 small scale units and 5 central public sector units. Additionally, the size of the Indian diagnostic and lab services is about 160 billion.

Not marred by recession or inflation, the pharma sector has a competitive advantage of prospering steadily and thus attracts lots of young professionals looking at pharmaceutical as their prospective career option. With the expected growth rate of 14% per annum, Indian Pharmaceutical sector is expected to create more jobs in India in near future and add 45,000 fresh openings to its current strength.

Since 2009-10 more than 900 new drug approvals have been given by the Indian drug regulator. The regulatory guidelines have been revised since the Supreme Court directives in 2011-12. Regulatory requirements are increasing in production, quality control and R & D laboratories. Therefore, the regulatory department in a Pharmaceutical company not only needs a very broad understanding of the regulatory requirements but also must understand the chemical processes of production and quality control, the analytical tests, the pre-clinical studies and the clinical trial reports. Further there is an international strategy to harmonize the guidelines using ICH. With about 25 leading pharmaceuticals and about 100 smaller units involved in exports the requirement of regulatory executives is constantly increasing. Some of the top Indian pharmaceuticals have more than 75 executives employed in the regulatory department alone.

The need to develop trained employable human resource:

The Indian Pharmaceutical and Chemical Industry have always been experiencing a dearth of skilled and industrially oriented human resource. The Industry despite employing students from chemistry, biology and pharmacy background always spends 6 months to one year for training the students for general industry needs like Good Laboratory Practices, Good Documentation Practices and regulatory compliances. The important component of knowledge and implementation of quality in laboratory analysis is scarce in the graduates of chemistry and pharmacy. The skilled manpower requirement is in the areas of R & D, quality assurance and intellectual property. The Pharmaceutical industry sector in India is the one of the strong Export oriented sectors that needs to comply with a multitude of regulatory compliances for marketing the drug formulations abroad. In India itself, the sector needs to comply to stringent regulatory compliances and audits before the drug formulations are marketed. The training in practice of GLP as per the current regulatory requirements is missing. This course will provide manpower that is work-ready.

Objectives of the Course

The course will address the requirements of conducting, managing and meeting regulatory requirements for R & D and testing laboratories in pharmaceutical and chemical industries. Major hurdle faced by the R&D centers at various Pharma laboratories is the lack of adequately trained and GLP oriented personnel. This forms a major setback when the application of sophisticated technology especially in the bio analytical field is concerned. The lacunae become more evident when dealing with newer dosage forms and peptide based drugs. This lacunae needs to addressed very diligently and the proposed programme is a step in this direction

The program will have the following objectives;

- To develop trained manpower in the field of Pharma Analytical Sciences with specific emphasis for instrumentation skills needed for analysis
- To amalgamate knowledge of classical analytical techniques with modern sophisticated instrumentation and provide training in the analysis of chemicals, drugs, food and other products.
- To introduce the training with powerful tools of instrumentation analysis in routine analysis at manufacturing, QC and research
- To provide exposure to National & International regulatory requirements with reference to drugs and chemicals
- To provide training in skills of analysis and develop knowledgeable and employable human resource
- To provide training in soft skills for efficient communication, technical writing, entrepreneurship and basic business management,

O._____ Eligibility:

- Higher Secondary School Certificate (10 + 2), Science or its equivalent.
- No age bar

R._____ Duration: SIX semesters (Three Years)

R._____ No of Lectures: 7 theory papers each semester equivalent to 2 credits each.
30 lectures for each paper per semester.

R._____ No of Practical periods: 2 practical papers each semester equivalent to 10 credits each.
300 hours for each practical per semester.

R._____ No. of credits: 18 credits of Skill component and 12 credits of general education component at each semester. Total 30 credits per semester.

Work Load : Two periods per week per paper where each period is of ONE hour duration

Twenty practical per week. Each practical is of Four periods where each period is of ONE hour duration.

One Seminar / assignment per Week. Each seminar is of ONE hour

Guidance to the students for assignments / projects / industrial visits / industrial training.

R._____ Passing Standard : Minimum 25 % marks in each paper and each practical and minimum 40 % marks in aggregate in Theory and Practical separately.

Number of Students 15 per batch

R. _____ The following will be the **staffing pattern** for the course;

- Instrument technician – 01
- Technical Assistant – 02
- Teaching staff – 03 (full time)
  and remaining workload to be completed using guest faculty.

Faculty

Post-graduate degree in the subject of Chemistry / Botany / Zoology, Microbiology / Biochemistry / Biotechnology with B+ and NET / SET as per the current University guidelines

Visiting Faculty from Industry & Research Institutes

The visiting Faculty will be from a post equivalent to that of Associate Professor level with Ph. D and not less than 5 years of research experience or with experience in industry not below Assistant Manager Level.

R._____ Mark-list

- The mark-list of the students must indicate titles of papers in the syllabus

R._____ details of the Syllabus

University of Mumbai

Credit Based, Semester & Grading System

SYLLABUS IN BRIEF : B.VOC, PHARMA ANALYTICAL SCIENCES :

Semester - I

Code	Paper	Credits	Lectures	L/Wk
Skill Component				
UVPAS101	Preparation of standard solutions and reagents	2	30	2
UVPAS102	Analytical applications of molecules and molecular Interactions	2	30	2
UVPAS103	Applied physical principles in instrumentation	2	30	2
UVPAS104	Introduction to data , data collection (sampling) and computation	2	30	2
UVPASP101	Practical based on Skill Components Industrial visits and assignments	10	300	10
General Education Component				
UVPAS105	Basic Chemistry and Chemical Interactions	2	30	2
UVPAS106	Chemistry and properties of solutes, solvents and solutions	2	30	2
UVPAS107	Skills of speaking and listening skills in communication	2	30	2
UVPASP102	Practical based on General Education Components	10	300	10

University of Mumbai
Credit Based, Semester & Grading System
SYLLABUS IN BRIEF : B.VOC, PHARMA ANALYTICAL SCIENCES :

Semester - II

Code	Paper	Credits	Lectures	L/Wk
Skill Component				
UVPAS201	Preparation of standard solutions and reagents - 2	2	30	2
UVPAS202	Analytical applications of molecules and molecular Interactions - 2	2	30	2
UVPAS203	Applied physical principles in instrumentation - 2	2	30	2
UVPAS204	Introduction to data , data collection (sampling) and computation - 2	2	30	2
UVPASP201	Practical based on Skill Components Industrial visits and assignments	10	300	10
General Education Component				
UVPAS205	Basic Chemistry and Chemical Interactions - 2	2	30	2
UVPAS206	Chemistry and properties of solutes, solvents and solutions - 2	2	30	2
UVPAS207	Skills of speaking and listening skills in communication - 2	2	30	2
UVPASP202	Practical based on General Education Components	10	300	10

University of Mumbai
Credit Based, Semester & Grading System
SYLLABUS IN BRIEF : B.VOC, PHARMA ANALYTICAL SCIENCES :

Semester - III

Code	Paper	Credits	Lectures	L/Wk
Skill Component				
UVPAS301	Basic techniques of recording laboratory data for QA	2	30	2
UVPAS302	Basics of separation techniques and laboratory analysis	2	30	2
UVPAS303	Sample preparation, storage and extraction techniques	2	30	2
UVPAS304	Statistical Evaluation and Data Management	2	30	2
UVPASP301	Practical based on Skill Components Industrial visits and assignments	10	300	10
General Education Component				
UVPAS305	Interactions between solutes, solvents & matrix components	2	30	2
UVPAS306	Analytical techniques for organic Compounds and natural products	2	30	2
UVPAS307	Skills of Technical writing and laboratory automation	2	30	2
UVPASP302	Practical based on General Education Components	10	300	10

University of Mumbai
Credit Based, Semester & Grading System
SYLLABUS IN BRIEF : B.VOC, PHARMA ANALYTICAL SCIENCES :

Semester - IV

Code	Paper	Credits	Lectures	L/Wk
Skill Component				
UVPAS401	Basic techniques of recording laboratory data for QA – 2	2	30	2
UVPAS402	Basics of separation techniques and laboratory analysis – 2	2	30	2
UVPAS403	Sample preparation, storage and extraction techniques – 2	2	30	2
UVPAS404	Statistical Evaluation and Data Management – 2	2	30	2
UVPASP401	Practical based on Skill Components Industrial visits and assignments	10	300	10
General Education Component				
UVPAS405	Interactions between solutes, solvents & matrix components – 2	2	30	2
UVPAS406	Analytical techniques for organic Compounds and natural products – 2	2	30	2
UVPAS407	Skills of Technical writing and laboratory automation – 2	2	30	2
UVPASP402	Practical based on General Education Components	10	300	10

University of Mumbai
Credit Based, Semester & Grading System
SYLLABUS IN BRIEF : B.VOC, PHARMA ANALYTICAL SCIENCES :

Semester - V

Code	Paper	Credits	Lectures	L/Wk
Skill Component				
UVPAS501	Analysis of samples of food, cosmetics and drugs	2	30	2
UVPAS502	Advanced techniques of analysis	2	30	2
UVPAS503	Automation of laboratory data and their management	2	30	2
UVPAS504	Industrial Training/Internship /project assignments	2	30	2
UVPASP501	Practical based on Skill Components Industrial visits and assignments	10	300	10
General Education Component				
UVPAS305	Applied molecular biology in analysis	2	30	2
UVPAS506	Pharmaceutical biochemistry and applications	2	30	2
UVPAS507	Entrepreneurship skills and project management	2	30	2
UVPASP502	Practical based on General Education Components	10	300	10

University of Mumbai
Credit Based, Semester & Grading System
SYLLABUS IN BRIEF : B.VOC, PHARMA ANALYTICAL SCIENCES :

Semester - VI

Code	Paper	Credits	Lectures	L/Wk
Skill Component				
UVPAS601	Analysis of samples of food, cosmetics and drugs – 2	2	30	2
UVPAS602	Advanced techniques of analysis – 2	2	30	2
UVPAS603	Automation of laboratory data and their management - 2	2	30	2
UVPAS604	Industrial Training/Internship /project assignments – 2	2	30	2
UVPASP601	Practical based on Skill Components Industrial visits and assignments	10	300	10
General Education Component				
UVPAS605	Applied molecular biology in analysis – 2	2	30	2
UVPAS606	Pharmaceutical biochemistry and applications – 2	2	30	2
UVPAS607	Entrepreneurship skills and project management – 2	2	30	2
UVPASP602	Practical based on General Education Components – 2	10	300	10

Code	Paper	Credits	Lectures	L/Wk
Skill Component				
UVPAS101	Preparation of standard solutions and reagents	2	30	2
	• Units of weights and measurements – concept of normality, molarity and molality • Concept of standard solution and their applications			
UVPAS102	Analytical applications of molecules and molecular Interactions	2	30	2
	• Concept of atomic mass, atomic number, isotopes and isomers • Concept of Ka, Kb and Km (enzymes) and their applications			
UVPAS103	Applied physical principles in instrumentation	2	30	2
	• Concept of electromagnetic spectrum and applications related to various spectral regions • Concept of Dispersion of light and scattering of light and their applications			
UVPAS104	Introduction to data , data collection (sampling) and computation	2	30	2
	• Concept of sample , sample statistic and population statistics • Basic Sampling techniques and their application in pharma			
UVPASP101	Practical based on Skill Components Industrial visits and assignments	10	300	10

Code	Paper	Credits	Lectures	L/Wk
General Education Component				
UVPAS105	Basic Chemistry and Chemical Interactions	2	30	2
	• Atomic Structure, Molecules and ions • Chemical Bonds and Chemical Reactions			
UVPAS106	Chemistry and properties of solutes, solvents and solutions	2	30	2
	• Concept of solubility, partition and their applications • Water as a universal solvent in living systems			
UVPAS107	Skills of speaking and listening skills in communication	2	30	2
	• General inter personal communications • General official communications			
UVPASP102	Practical based on General Education Components	10	300	10

Code	Paper	Credits	Lectures	L/Wk
Skill Component				
UVPAS201	Preparation of standard solutions and reagents - 2	2	30	2
	• Principles in the use of indicators, colour reagents and derivatizing agents • Dilutions and dilution techniques and their applications			
UVPAS202	Analytical applications of molecules and molecular Interactions - 2	2	30	2
	• Chemical reactions and equilibrium • Radioisotopes, labeled/tagged probes in bioanalysis (including ELISA)			
UVPAS203	Applied physical principles in instrumentation - 2	2	30	2
	• Various properties of light and their applications in measurement • Concept of monochromatic light, LASER and their uses			
UVPAS204	Introduction to data , data collection (sampling) and computation - 2	2	30	2
	• Concepts of Quantitative data, qualitative data and their statistical evaluation • Applications of various data representation techniques			
UVPASP201	Practical based on Skill Components Industrial visits and assignments	10	300	10

Code	Paper	Credits	Lectures	L/Wk
General Education Component				
UVPAS205	Basic Chemistry and Chemical Interactions - 2	2	30	2
	• Catalysts and their roles in reactions • Basic Concepts of enzymes and enzymatic reactions			
UVPAS206	Chemistry and properties of solutes, solvents and solutions - 2	2	30	2
	• Properties of solvents and their applications • Concept of pH, buffers and their applications			
UVPAS207	Skills of speaking and listening skills in communication - 2	2	30	2
	• Techniques of effective expression of ideas • General written communications			
UVPASP202	Practical based on General Education Components	10	300	10

Code	Paper	Credits	Lectures	L/Wk
Skill Component				
UVPAS301	Basic techniques of recording laboratory data for QA	2	30	2
	• Concepts of QA and QC and their significance • GLP and its practice			
UVPAS302	Basics of separation techniques and laboratory analysis	2	30	2
	• Types of chromatographic separations and their applications • Introduction to separation techniques other than chromatography			
UVPAS303	Sample preparation, storage and extraction techniques	2	30	2
	• Sample storage and sample processing • Various extraction techniques and their role in separation			
UVPAS304	Statistical Evaluation and Data Management	2	30	2
	• Data analysis for sample statistics • Concept of sample size and its importance in managing variability			
UVPASP301	Practical based on Skill Components Industrial visits and assignments	10	300	10

Code	Paper	Credits	Lectures	L/Wk
General Education Component				
UVPAS305	Interactions between solutes, solvents & matrix components	2	30	2
	• Partition coefficient and its applications • Selection of methods based on different matrices			
UVPAS306	Analytical techniques for organic Compounds and natural products	2	30	2
	• Analytical techniques involving biological matrices and macromolecules • Analysis based on various properties of organic compounds and macromolecules			
UVPAS307	Skills of Technical writing and laboratory automation	2	30	2
	• Test reports and their formats • Autosamplers as simple automation devices			
UVPASP302	Practical based on General Education Components	10	300	10

Code	Paper	Credits	Lectures	L/Wk
Skill Component				
UVPAS401	Basic techniques of recording laboratory data for QA – 2	2	30	2
	• Concept of TQM and role of analyst • Quality of data and significance of data integrity			
UVPAS402	Basics of separation techniques and laboratory analysis – 2	2	30	2
	• Instrumentation and their working in Chromatographic separation • Instrumentation and their working in separation techniques other than chromatography			
UVPAS403	Sample preparation, storage and extraction techniques – 2	2	30	2
	• Sample pre-treatment techniques • Solid phase extraction & automation in sample treatment			
UVPAS404	Statistical Evaluation and Data Management – 2	2	30	2
	• Comparison of samples • Concept of significance and confidence intervals			
UVPASP401	Practical based on Skill Components Industrial visits and assignments	10	300	10

Code	Paper	Credits	Lectures	L/Wk
General Education Component				
UVPAS405	Interactions between solutes, solvents & matrix components – 2	2	30	2
	• Concept of resolution, selectivity and specificity of analysis • Importance of solute-solvent interaction in various analysis			
UVPAS406	Analytical techniques for organic Compounds and natural products – 2	2	30	2
	• Analytical techniques for minerals, oils and phytochemicals • Analytical techniques for polymers, dyes and pesticides			
UVPAS407	Skills of Technical writing and laboratory automation – 2	2	30	2
	• Technical writing styles and reports • Liquid handing systems and automated work stations			
UVPASP402	Practical based on General Education Components	10	300	10

Code	Paper	Credits	Lectures	L/Wk
Skill Component				
UVPAS501	Analysis of samples of food, cosmetics and drugs	2	30	2
	• Analytical techniques for food products • Various analytical techniques for of drugs and cosmetics			
UVPAS502	Advanced techniques of analysis	2	30	2
	• Hyphenated techniques in analysis- 1 • Applications of atomic properties for analysis - 1			
UVPAS503	Automation of laboratory data and their management	2	30	2
	• Laboratory information systems and their significance • E-records and their management			
UVPAS504	Industrial Training/Internship /project assignments	2	30	2
	• Students will be completing an assignment at an industrial unit (min 45 days)			
UVPASP501	Practical based on Skill Components Industrial visits and assignments	10	300	10

Code	Paper	Credits	Lectures	L/Wk
General Education Component				
UVPAS505	Applied molecular biology in analysis	2	30	2
	• PCR and its applications • Restriction enzymes and their applications			
UVPAS506	Pharmaceutical biochemistry and applications	2	30	2
	• Different pharmaceutical preparations and their applications • Analysis of excipents and their significance			
UVPAS507	Entrepreneurship skills and project management	2	30	2
	• Initiating and sustaining start-up projects in analytical services • Planning and financing start-up projects			
UVPASP502	Practical based on General Education Components	10	300	10

Code	Paper	Credits	Lectures	L/Wk
Skill Component				
UVPAS601	Analysis of samples of food, cosmetics and drugs – 2	2	30	2
	• Residue analysis in finished products • Regulatory analysis of consumer products			
UVPAS602	Advanced techniques of analysis – 2	2	30	2
	• Hyphenated techniques in analysis – 2 • Applications of atomic properties for analysis – 2			
UVPAS603	Automation of laboratory data and their management – 2	2	30	2
	• Compliance to CFR part 11 • Data integrity, security and archival			
UVPAS604	Industrial Training/Internship /project assignments – 2	2	30	2
	• Students will be completing an assignment at an industrial unit (min 45 days)			
UVPASP601	Practical based on Skill Components Industrial visits and assignments	10	300	10

Code	Paper	Credits	Lectures	L/Wk
General Education Component				
UVPAS605	Applied molecular biology in analysis – 2	2	30	2
	• Nano particles and their applications • Techniques in proteomics			
UVPAS606	Pharmaceutical biochemistry and applications – 2	2	30	2
	• Drug delivery systems and their applications • Analytical approach to standardising drug delivery systems			
UVPAS607	Entrepreneurship skills and project management – 2	2	30	2
	• Management project timelines and deliveries • Management of finances and other resources			
UVPASP602	Practical based on General Education Components – 2	10	300	10

Practical:

Orientation practical : It will include introduction to Indian Pharmacopoeia, its parts, its use in the context of drugs and cosmetic act

1. Preparation of Normal solution, molar solution, molal solution
2. Identification of Laboratory glassware & Micropipetting
3. Use of Analytical balance, Monopan balance & calibrated weight box
4. Washing of laboratory glass ware chromic Acid preparation & use
5. Introduction, Lab note book, dress code, safety shower etc.
6. Instrument Identification, Usage logs, SOP, Calibration / Maintenance Records, IQ, OQ, PQ concepts
7. Distilled Water & distillation unit
8. Calibration & Preventive maintenance -- Balance, micropipette, pH meter, Colorimeter, Muffale furnace
9. Recording of Temperature & Humidity.
10. COA & documentation for sample identification & record
11. a) Stability chamber & its use
    b) Deep freezers - -20°C, -85° & their usage
12. Preparation of PO4 buffer & bicarbonate buffer
13. Preparation of Mobile phase for chromatography (use of separating Funnel)

14. Paper chromatographic separation of Amino acids, formulation:-

15. TLC on glass plate for fatty acids with iodine vapour visualization

16. Al. plate TLC for various compounds

    a) Direct visualization

    b) derivatisation

    c) uv visualization

17. Identification of best filter for colorimetry of given colored solution

18. Identification of T max of given sample (demonstration & interpretation of Spectrogram)

19. Tabet - Physical assays – Uniformity of wt

20. - Hardness

21. - friability

22. Total Ash,

23. Total organic content

24. Alcohol soluble, water soluble, Acid in soluble – etc (Proximate)

25. ELISA & its Usage

26. Colorimetric Estimation of glucose

27. Colorimetric estimation of – from formulation

28. Calculation of Mean, SD, C V

29. Graphical re-presentation

30. Calculation of A N O V A, student t test

31. Scatter diagram, Trend line, regression equation & correlation Coefficient
32. Audit of laboratory notes
33. Laboratory Safety signs & meaning, making laboratory signs
34. Fire fighting – usage of fire Extinguisher & its types
35. Waste disposal bags, colors & meanings – Biohazard waste
36. Use of Scientific calculator Logarithm, Antilog, Mean & SD
37. Assignment of
    a) Microsoft Power Point
    b) Microsoft EXCEL
    c) Microsoft Word & Conversion of PDF
38. – Filling of requisition Form,
    -- Letter for Plasma
    -- Spirit License & renewal
    -- Request of Bio Waste disposal
    -- Bio waste disposal – Agreement
39. Volumetric titration
    - Acid base
    - Precipitation
    - With Eriochome black T- indicter
    - with pH meter

- Thermometer
- Semi micro analysis
- Organic Analysis
- Volumetric Glass ware & sieves
- Powder analysis
- Syrup – Viscosity
- Refractive Index
- Specific gravity
- Absorbence of – Water holding capacity
- Estimation of Moisture
- Acid value
- Saponification Value
- Iodine value
- Peroxide value
- Unsaponifiable matter
- Vitamin Assay
- Closure for injections
- Sterilization method
- Indicators
-- Reference Substance

Basic Skills in Analytical Techniques and Practical Skills in following aspects of various analytical instruments:

- Instrumentation
- Working
- Sample Processing
- Analysis, On-Line trouble shooting
- Reporting
- Documentations

- IR Spectroscopy , FTIR
- HPTLC
- HPLC
- GC
- Introduction to CE
- Introduction to MS and Hyphenated techniques – LC-MS, GC-MS

The Scheme of Examination and Allotment of marks are tabulated below;

***B. VOC.* (PHARMACEUTICAL ANALYSIS)**						
FIRST YEAR (1000 MARKS PER SEMESTER)						
THEORY					**PRACTICAL**	
CODE		**MARKS**	**(75:25) SCHEME**	**CODE**		**MARKS**
UVPAS101	SC-1	80	60:20	**UVPASP101**	SP-1	100
UVPAS102	SC-2	80	60:20		SP-2	100
UVPAS103	SC-3	80	60:20		SP-3	100
UVPAS104	SC-4	80	60:20		SP-4	100
UVPAS105	GC-1	30	23:07	**UVPASP102**	GC-1	100
UVPAS106	GC-2	30	23:07		GC-2	100
UVPAS107	GC-3	20	15:05			
	TOTAL MARKS	**400**			**600**	
	GRAND TOTAL				**1000**	

NOTE : SC= Skilled Component, GC= General Component

***B. VOC.* (PHARMACEUTICAL ANALYSIS)**						
SECOND YEAR (1000 MARKS PER SEMESTER)						
THEORY					**PRACTICAL**	
CODE		**MARKS**	**(75:25) SCHEME**	**CODE**		**MARKS**
UVPAS201	SC-1	80	60:20	**UVPASP201**	SP-1	100
UVPAS202	SC-2	80	60:20		SP-2	100
UVPAS203	SC-3	80	60:20		SP-3	100
UVPAS204	SC-4	80	60:20		SP-4	100
UVPAS205	GC-1	30	23:07	**UVPASP202**	GC-1	100
UVPAS206	GC-2	30	23:07		GC-2	100
UVPAS207	GC-3	20	15:05			
	TOTAL MARKS	**400**			**600**	
	GRAND TOTAL				**1000**	

NOTE : SC= Skilled Component, GC= General Component

***B. VOC.* (PHARMACEUTICAL ANALYSIS)**						
THIRD YEAR (800 MARKS PER SEMESTER)						
THEORY					**PRACTICAL**	
CODE		**MARKS**	**(75:25) SCHEME**	**CODE**		**MARKS**
UVPAS301	SC-1	80	60:20	**UVPASP301**	SC-1	120
UVPAS302	SC-2	80	60:20		SC-2	120
UVPAS303	SC-3	80	60:20		SC-3	120
UVPAS304	GC-1	80	25:15	**UVPASP302**	GC-1	120
	TOTAL MARKS	**320**		**480**		
GRAND TOTAL				**800**		

NOTE : SC= Skilled Component, GC= General Component