

Andhra Pradesh State Council of Higher Education
Implementation of CBCS in Undergraduate Colleges in Andhra Pradesh
Guidelines

As the universities are aware, a review of the syllabi implemented from 2015-16 under CBCS was taken up by the APSICHE based on the feedback received and as per the UGC guidelines. The review was made for a few select subjects that are common in colleges, i.e., Mathematics, Physics, Computer Sci/IT, Chemistry, Botany, Zoology (BSc), Economics, History, Political Science, Public Administration (BA) and English and Telugu (Language subjects). The syllabi of B.Com., BBA and BCA, and Foundation Courses were also reviewed. The universities were requested to do a similar exercise in respect of other subjects. In fact, no significant changes were made in the syllabi of the first two years (first four semesters) in most of the subjects.

The review was intended to rectify mistakes and to reduce the excess load, if any, in case of core papers. Further, Syllabi for Electives in various subjects were to be prepared. Another task was preparation of syllabi for Degree Honours Programmes. The APSICHE, therefore, constituted subject review committees and got the tasks completed in April, 2016. The revised (modified) syllabi were communicated to universities and requested them to keep the syllabi on their websites inviting suggestions from the colleges.

The final version of the revised (modified) syllabi for all the three years are being sent to all the universities to be implemented from 2016-17 along with these guidelines.

The following guidelines may be followed in the implementation of CBCS framework and syllabi from the academic year 2016-17. The implementation year, however, remains as 2015-16.

1. The slightly revised framework of CBCS is being sent to all universities and the same is to be implemented from 2016-17. Foundations courses were a little reshuffled based on feedback. Two Skill Development Courses in V and VI Semesters (to be designed by the respective universities) were dispensed with. Now there are only 10 Foundation Courses.
2. The syllabi of the common subjects in BA and BSc were reviewed for rectifications and the reviewed final syllabi for all the three years are being sent to all the universities, along with these guidelines. The common subjects are, Mathematics, Physics, Computer Sci/IT, Chemistry, Botany, Zoology (BSc), Economics, History, Political Science, Public Administration, Special English, Special Telugu (BA), and B.Com, BBA and BCA. These reviewed syllabi are to be implemented by the universities from 2016-17. The final syllabi of General English and General Telugu (Language subjects) were already communicated (there is no change in General Telugu of 2015-16).
3. Similarly, reviewed and rectified syllabi of Foundation Courses are also being sent to the universities for implementation from 2016-17.
4. Regarding the Electives (in the VI Semester), the following guidelines are to be followed.
 - a. Papers VII and VIII will be Electives for any domain subject and both the papers will be offered in the same VI Semester of the final year (except in B.Com and BBA where the old pattern (VI and VIII papers are Electives) was retained).
 - b. At Paper -VII, a student will pursue three Electives respectively belonging to the three domain subjects. For example, an MPC student will study one each Elective from Mathematics, Physics and Chemistry as individual Elective paper VII. He/she will choose from the multiple individual Electives offered for each subject.

- c. Whereas, as Paper -VIII, the student will study all the three papers as a cluster from the same subject (one of the three subjects). These three papers will cover a wide stream and will give a wider learning experience to the students. For example, as Paper -VIII, an MPC student will pursue all the three papers belonging to Physics (VIII-A-1,2&3 or VIII-B-1,2&3 or....) from out of alternate Clusters of Electives of Physics and will not study Mathematics and Chemistry. Each Cluster will have three Electives.
 - d. The universities have to accommodate the above facility to all students in all colleges.
 - e. The list of Electives and cluster Electives for each subject, along with their syllabi, for Papers VII & VIII will be displayed in the websites of all universities and that of APSCHE.
 - f. The colleges may choose the Electives for Papers VII and Clusters for paper VIII depending on the local needs in terms of students' local employability and those chosen Electives can be offered in the college.
 - g. A college may offer one or more Electives for each subject depending the availability of facilities, teachers and local expertise/opportunities. The selection of Electives may be at the college level and even at the student level if the colleges can afford suitable staff and facilities. The universities may be obliged to consider the choice of the college/students.
 - h. Further, a college may identify its own novel and useful Electives, prepare syllabi/curricula, in consultation with the affiliating university, and offer the same to its students after the approval of the affiliating university concerned.
 - i. The Electives of VI Semester (in case of V & VI in B.Com) may be treated as 'specialisation' and the title of the 'stream' may be mentioned in the provisional pass certificate of BA/BCom/BSc students.
 - j. In respect of B.Com. with papers of 'Computer Applications' as Electives in V&VI Semesters in the V and VI Semesters, the respective universities may permit the colleges to collect additional fee for meeting the additional expenses.
5. In respect of all the other subjects (other than the select common subjects mentioned above for which APSCHE has reviewed the syllabi), the universities may themselves prepare the syllabi in the CBCS Framework given including Electives and Cluster Electives.
 6. All the universities and colleges shall follow the spirit and advantages of CBCS pattern and utilize it to a maximum extent for the benefit of the student and society. The separation of syllabus into Core and Electives and the facility of 'choice' to the student under CBCS are to be effectively utilized, especially in offering useful and skill/job-oriented Electives in multiple numbers, including the utilizing the local resources and opportunities.
 7. The Universities are requested to limit their syllabi of PG Entrance Tests to the Six Core papers of the respective subject. The Electives are intended to enhance the job/work oriented experience, knowledge and skills in the local, regional or global contexts.
 8. The effective implementation of the spirit of CBCS will enhance the much desirable competencies of degree students.
 9. The full cooperation of universities is sought in all the above matters.
 - 10. The Universities are requested to remove the syllabi of all the subjects from the University records as well as University website sent by APSCHE prior to 30.5.2016**

to avoid confusion. Further, the Universities shall place the new syllabi sent here with on their website.

Andhra Pradesh State Council of Higher Education
Structure of B. A. HISTORY Syllabus under CBCS

Table-1: w.e.f. 2015-16 (Revised in April, 2016)

<i>Semester</i>	<i>Paper</i>	<i>Title</i>
Semester I (Core)	I	Ancient Indian History & Culture (from earliest times to 600 A.D)
Semester II (Core)	II	Early Medieval Indian History & Culture (600 A.D to 1526 A. D.)
Semester III (Core)	III	Late Medieval & Colonial History of India (1526 to 1857 A. D.)
Semester IV (Core)	IV	Social Reform Movement & Freedom Struggle (1820s to 1947 A.D.)
Semester V (Core)	V	Age of Rationalism And Humanism The World Between 15 th & 18 th Centuries
Semester V (Core)	VI	History & Culture of Andhra Desa (from 12 th to 19 th Century A.D.)
Semester VI Elective - 1	VII-A	History of Modern Europe (from 19 th Century to 1945 A. D.)
Semester VI Elective - 2	VII-B	History of East Asia (from 19 th Century A.D.to 1950 A.D)
Semester VI Elective - 3	VII-C	Contemporary History of The World (1945 to Circa 2000 A. D.)
Semester VI Elective - 4	VII-D	Basics of Journalism
Semester VI Elective - 5	VII-E	Historical Application in Tourism
Semester VI Elective - 6	VII-F	Modern Techniques in Archaeology
Semester VI Cluster Electives Elective - 1	VIII-A-1	Cultural Tourism in Andhra Pradesh
Elective - 2	VIII-A-2	Popular Movements in Andhra Desa (1848 TO 1956 A.D.)
Elective - 3	VIII-A-3	Contemporary History of Andhra Pradesh (1956-2014)

Structure of B.A. HISTORY Syllabus under CBCS

Table-2:

Sl. No	Sem	Paper	Name of Paper	Nature	Hours/Week	Credits	Marks	
							Mid Sem	Sem End
1	I	I	Ancient Indian History & Culture (From earliest times to 600 A.D)	Core	5	4	25	75
2	II	II	Early Medieval Indian History & Culture (600 A.D to 1526 A. D.)	Core	5	4	25	75
3	III	III	Late Medieval & Colonial History of India (1526 to 1857 A. D.)	Core	5	4	25	75
4	IV	IV	Social Reform Movement & Freedom Struggle (1820s to 1947 A.D.)	Core	5	4	25	75
5	V	V	Age of Rationalism and Humanism The World Between 15 th & 18 th Centuries	Core	5	4	25	75
6		VI	History & Culture of Andhra Desa (from 12 th to 19 th Century A.D.)	Core	5	4	25	75
7	VI	VII-(A)	History of Modern Europe (from 19 th Century to 1945 A. D.)	El	5	4	25	75
		VII-(B)	History of East Asia (from 19 th Century A.D.to 1950 A.D)					
		VII-(C)	Contemporary History of The World (1945 to Circa 2000 A. D.)					
		VII-(D)	Basics of Journalism					
		VII-(E)	Historical Application in Tourism					
		VII-(F)	Modern Techniques in Archaeology					
8	VI	VIII-A-1	Cultural Tourism In Andhra Pradesh	CI El (3)	5	4	25	75
		VIII-A-2	Popular Movements In Andhra Desa (1848 TO 1956 A.D.)					
		VIII-A-3	Contemporary History of Andhra Pradesh (1956-2014)					
TOTAL						32	200	600

Andhra Pradesh State Council of Higher Education
 Structure of BA - Political Science under CBCS w.e.f.2015-16
 Revised in April, 2016

Yr	Sem ester	Paper	Title	Hr/ Wk	Cre dits	Marks		
						Int	Ext	
1	I	I	Basic Concepts of Political Science	5	4	25		
	II	II	Political Institutions (Concepts, Theories and Institutions)	5	4	25	75	
2	III	III	Indian Constitution	5	4	25	75	
	IV	IV	Indian Political Process	5	4	25	75	
3	V	V	Indian Political Thought	5	4	25	75	
		VI	Western Political Thought	5	4	25	75	
	VI	VII	Electives (any one) VII-(A): Major issues in Indian Politics (or) VII-(B): Principles of Public Administration (or) VII-(C): Local Self - Government in Andhra Pradesh	5	4	25	75	
			VIII	Cluster Electives (any one cluster, i.e., set of three papers) Elective VIII-A-1: Colonialism and Nationalism in India	5	4	25	75
				Elective VIII-A-2: Political Economy of Development in India Elective VIII-A-3: Feminism: Theory and Practice (or) Elective VIII-B-1: Comparative Constitutionalism; UK, USA Elective VIII-B-2: Human Rights in a Comparative Perspective Elective VIII-B-3: Political Sociology (or) Elective VIII-C-1: International Relations Elective VIII-C-2: Indian Foreign Policy Elective VIII-C-3: Contemporary Global Issues	5	4	25	75

Note: Student Activities like Data/picture analysis, Seminars, Assignments, Group Discussions, Case studies, Fieldwork, Surveys, Study Projects, Models are Part of Curriculum in all papers. The teacher shall identify appropriate activities for each unit and assign them to all the students for improving domain skills.

BA Economics Syllabus under CBCS

w.e.f. 2015-16 (Revised in April 2016)

Structure of Syllabus

Table-1:

<i>Semester</i>	<i>Paper</i>	<i>Title</i>
Semester I (Core)	I	Micro Economics – Consumer Behavior
Semester II (Core)	II	Micro Economics - Production and Price theory
Semester III (Core)	III	Macro Economics - National Income, Employment and Money
Semester IV (Core)	IV	Macro Economics - Banking and International Trade
Semester V (Core)	V	Economic Development and Indian Economy
Semester V (Core)	VI	Indian and Andhra Pradesh Economy
Semester VI *Any one Paper from A,B,C,D,E F and G	VII – (A)	Agricultural Economics
	VII – (B)	Principles of Insurance
	VII – (C)	Financial Markets and Institutions
	VII – (D)	Rural Economics And Social Change
	VII – (E)	Entrepreneurship and Small Business Development
	VII – (F)	Public Finance
	VII – (G)	International Economics
Semester VI ** Any one Cluster from A, B, C, D and E	Cluster Electives – (A) Agribusiness	
	VIII	A-1: Agribusiness Environment in Andhra Pradesh
		A-2: Agricultural output Marketing
		A-3: Agricultural Input Marketing.
	Cluster Electives – (B) Insurance Practice	
	VIII	B-1. Practice of General Insurance
		B-2. Agricultural Insurance
		B.-3 Health Insurance
	Cluster Electives – (C) Financial Markets	
	VIII	C-1: Stock Market operations
		C:-2 Securities Market
		C: -3Commodities Market
	Cluster Electives – (D) Rural Economy	
	VIII	D.-1 Rural Economy
		D. -2 Rural Industrilisation
		D.-3 Rural Marketing
	Cluster Electives – (E) Entrepreneurship	
VIII	E.-1 Industrial Economics	
	E.-2 Labour Economics	
	E.-3 Industrial Management	

*Student has to choose only one paper

** Students are advised to choose Cluster (A) if they have chosen VII (A) and Choose Cluster (B) if they have chosen VII (B) etc. However, it is only suggestive.

Table – 2:

Sl. No	Paper	Name of Paper	Sem	Hours/Week	Credits	Marks	
						Mid Sem	Sem End
1	I	Micro Economics – Consumer Behavior	I	5	4	25	75
2	II	Micro Economics - Production and Price theory	II	5	4	25	75
3	III	Macro Economics - National Income, Employment and Money	III	5	4	25	75
4	IV	Banking and International Trade	IV	5	4	25	75
5	V	Economic Development and Indian Economy	V	5	4	25	75
6	VI	Indian and Andhra Pradesh Economy	V	5	4	25	75
7	VII – (A)	Agricultural Economics	VI	5	4	25	75
	VII – (B)	Principles of Insurance					
	VII – (C)	Financial Markets and Institutions					
	VII – (D)	Rural Economy and Social Change					
	VII – (E)	Entrepreneurship and Small Business Development					
	VII – (F)	Public Finance					
	VII – (G)	International Economics					
8	Cluster Elective – A: Agribusiness		VI	5	4	25	75
	VIII	A-1. Agribusiness Environment in Andhra Pradesh					
		A-2. Agricultural Output Marketing					
		A-3. Agricultural Input Marketing.					
	Cluster Elective – B: Insurance Practice		VI	5	4	25	75
	VIII	B-1. Practice of General Insurance					
		B-2. Agricultural Insurance					
		B-3. Health Insurance					
	Cluster Elective - C: Financial Markets		VI	5	4	25	75
	VIII	C-1. Stock Market operations					
		C-2. Securities Market					
		C-3. Commodities Market					
	Cluster Elective – D: Rural Economy		VI	5	4	25	75
	VIII	D-1. Rural Economy					
		D-2. Rural Industrilisation					
		D-3. Rural Marketing					
	Cluster Elective – E: Entrepreneurship		VI	5	4	25	75
	VIII	E-1. Industrial Economics					
		E-2. Labour Economics					
		E-3. Industrial Management					

3. Glasses: The glass transition - theories for the glass transition, Factors that determine the glass-transition temperature. Glass forming systems and ease of glass formation, preparation of glass materials. Applications of Glasses: Introduction: Electronic applications, Electrochemical applications, optical applications, Magnetic applications.

UNITS-IV (12 hrs)

4. Liquid Crystals: Mesomorphism of anisotropic systems, Different liquid crystalline phase and phase transitions, Thermal and electrical properties of liquid crystals, Types Liquid Crystals displays, few applications of liquid crystals.

UNITS-V (12 hrs)

5. Characterization Methods: XRD, SEM, TEM, AFM, XPS and PL characterization techniques for nano materials. Electrical and mechanical properties, Optical properties by IR and Raman Spectroscopy.

References books

1. Encyclopedia of Nanotechnology by M.Balakrishna Rao and K.Krishna Reddy, Vol.I to X, Campus books.
2. Nano: The Essentials-Understanding Nanoscience & Nanotechnology by T.Pradeep; Tata Mc. Graw Hill
3. Nanotechnology in Microelectronics & Optoelectronics, J.M Martine Duart, R.J Martin Palma, F. Agullo Rueda, Elsevier
4. Nanoelectronic Circuit Design, N.K Jha, D Chen, Springer
5. Handbook of Nanophysics- Nanoelectronics & Nanophotonics, K.D Sattler, CRC Press
6. Organic Electronics-Sensors & Biotechnology- R. Shinar & J. Shinar, McGraw-Hill

Cluster Elective Paper- VIII-B-2: Practical: Synthesis and Characterization of Nanomaterials **2hrs/Week**

Minimum of 6 experiments to be done and recorded

1. Synthesis of nanocrystalline films of II-VI compounds doped with rare earths by chemical process.
2. Synthesis of Alkaline earth aluminates in nanocrystalline form by combustion synthesis.
3. Preparation of surface conducting glass plate by spray pyrolysis method
4. Preparation of surface conducting glass plate by chemical route
5. Fabrication of micro fluidic nanofilter by polymerisation reaction
6. Absorption studies on the nanocrystalline films and determination of absorption coefficient.
7. Determination of band gap from the absorption spectra using Tauc's plots.
8. Study of Hall effect in semiconductors and its application in nanotechnology.
9. Measurement of electrical conductivity of semiconductor film by Four Probe method and study of temperature variation of electrical conductivity.

Cluster Elective Paper –VIII-C-3: Practical: Energy Storage Devices
2hrs/Week

Minimum of 6 experiments to be done and recorded

1. Study of charge and discharge characteristics of storage battery.
2. Study of charging and discharging behavior of a capacitor.
3. Determination of efficiency of DC-AC inverter and DC-DC converters
4. Study of charging characteristics of a Ni-Cd battery using solar photovoltaic panel.
5. Performance estimation of a fuel cell.
6. Study of effect of temperature on the performance of fuel cell.

B.Sc. (Physics) (Non-Mathematics Combinations)
Scheme of instruction and examination to be followed w.e.f. 201-2017

S.No	Semester	Title of the paper	Instruction Hrs/week	Duration of exam (hrs)	Max Marks (external)
Theory					
1	First	Paper I: Mechanics & Properties of Matter	4	3	75
2	Second	Paper II: Waves & Oscillations	4	3	75
3	Third	Paper III: Optics	4	3	75
4	Fourth	Paper IV: Thermodynamics & Radiation Physics	4	3	75
5	Fifth	Paper V: Electricity, Magnetism & electronics	4	3	75
		Paper VI: Modern Physics & Medical Physics	4	3	75
6	Sixth	Paper VII : Elective	4	3	75
		Paper VIII: Cluster Electives	4	3	75
Practical					
1	First	Practical 1	2	3	50
2	Second	Practical II	2	3	50
3	Third	Practical III	2	3	50
4	Fourth	Practical IV	2	3	50
5	Fifth	Practical V	2	3	50
6		Practical VI	2	3	50
7	Sixth	Practical VII	2	3	50
8		Practical VIII	2	3	50

Andhra Pradesh State Council of Higher Education
B.Sc. Chemistry Syllabus under CBCS
w.e.f. 2015-16 (revised in April 2016)

Structure of Chemistry Syllabus Under CBCS

YEAR	SEMESTER	PAPER	TITLE	MARKS	CREDITS		
I	I	I	Inorganic and Organic Chemistry	100	03		
			Practical – I	50	02		
	II	II	Physical and General Chemistry	100	03		
			Practical – II	50	02		
II	III	III	Inorganic and organic Chemistry	100	03		
			Practical – III	50	02		
	IV	IV	Spectroscopy and Physical Chemistry	100	03		
			Practical – IV	50	02		
III	V	V	Inorganic ,Organic and Physical Chemistry	100	03		
			Practical – V	50	02		
		VI	VI	Inorganic ,Organic and Physical Chemistry	100	03	
				Practical – VI	50	02	
	* Any one Paper from VII A, B and C	VII (A)*	VII (A)*	Elective	100	03	
				Practical - VII A	50	02	
			VII (B)*	VII (B)*	Elective	100	03
					Practical - VII B	50	02
			VII (C)*	VII (C)*	Elective	100	03
					Practical - VII C	50	02
	** Any one cluster from VIII, A, B and C	VI	VIII (A)**	Cluster Electives - I :	100	03	
				VIII-A-1	100	03	
				VIII-A-2	100	03	
				VIII-A-3	50	02	
					50	02	
					50	02	
			VIII (B)**	VIII (B)**	Cluster Electives - II ::	100	03
					VIII-B-1	100	03
VIII- B-2					100	03	
VIII-B-3					50	02	
					50	02	
					50	02	
VIII (C)**	VIII (C)**	Cluster Electives - III ::	100	03			
		VIII-C-1	100	03			
		VIII-C-2	100	03			
		VIII-C-3	50	02			
			50	02			
			50	02			

I. LABORATORY COURSE – VIII

Practical Paper – VIII-B-1: (at the end of semester VI)

30 hrs (2 h / W)

1. Preparation of Aspirin
2. Preparation of Paracetamol
3. Preparation of Acetanilide
4. Preparation of Barbutiric Acid
5. Preparation of Phenyl Azo β -naphthol

II. LABORATORY COURSE – VIII

Practical Paper – VIII-B-2: (at the end of semester VI)

30 hrs (2 h / W)

1. Green procedure for organic qualitative analysis: Detection of N, S and halogens
2. Acetylation of 1^o amine by green method: Preparation of acetanilide
3. Rearrangement reaction in green conditions: Benzil-Benzilic acid rearrangement
4. Electrophilic aromatic substitution reaction: Nitration of phenol
5. Radical coupling reaction: Preparation of 1,1-bis -2-naphthol
6. Green oxidation reaction: Synthesis of adipic acid
7. Green procedure for Diels Alder reaction between furan and maleic anhydride

List of Reference Books

1. Green Chemistry Theory and Practice. P.T. Anatas and J.C. Warner
2. Green Chemistry V.K. Ahluwalia Narosa, New Delhi.
3. Real world cases in Green Chemistry M.C. Cann and M.E. Connelly
4. Green Chemistry: Introductory Text M.Lancaster: Royal Society of Chemistry (London)
5. Green Chemistry: Introductory Text, M.Lancaster
6. Principles and practice of heterogeneous catalysis, Thomas J.M., Thomas M.J., John Wiley
7. Green Chemistry: Environmental friendly alternatives R S Sanghli and M.M Srivastava, Narosa Publications

VII-A-3 Practical:- Project Work / Intern Ship

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2015-2016 (Modified in April 2016)
Structure of Computer Science/Information Technology (IT) Syllabus

Semester	Paper	Subject	Hrs.	Credits	IA	ES	Total	
FIRST YEAR								
SEMESTER I	I	Computer Fundamentals and Photoshop	4	3	25	75	100	
		Photo Shop Lab	2	2	0	50	50	
SEMESTER II	II	Programming in C	4	3	25	75	100	
		Programming in C Lab	2	2	0	50	50	
SECOND YEAR								
SEMESTER III	III	Object Oriented Programming Using Java	4	3	25	75	100	
		Object Oriented Programming Using Java Lab	2	2	0	50	50	
SEMESTER IV	IV	Data Structures	4	3	25	75	100	
		Data Structures using Java Lab	2	2	0	50	50	
THIRD YEAR								
SEMESTER V	V	DBMS	3	3	25	75	100	
		DBMS Lab	2	2	0	50	50	
	VI	Software Engineering	3	3	25	75	100	
		Project- 1	2	2	0	50	50	
SEMESTER VI	VII (A/B/ C)	Elective-I						
		A. Operating Systems	3	3	25	75	100	
		Operating Systems Lab	3	2	0	50	50	
		B. Computer Networks	3	3	25	75	100	
		Computer Networks Lab	3	2	0	50	50	
		C. Web Technologies	3	3	25	75	100	
		Web Technologies Lab	3	2	0	50	50	
	VIII Clust er -A-A1 ,A2 or Clust er-B- B1,B2 Or Clust er - C - C1,C2	Elective-II(Cluster A)						
		A1. Foundations of Data Science	3	3	25	75	100	
		Foundations of Data Science Lab (through R)	3	2	0	50	50	
		A2. Big Data Technology	3	3	25	75	100	
		Big Data Technology Lab (Hadoop)	3	2	0	50	50	
		Elective-II(Cluster B)						
		B1. Distributed Systems	3	3	25	75	100	
		Distributed Systems Lab	3	2	0	50	50	
		B2. Cloud Computing	3	3	25	75	100	
		Cloud Computing Lab	3	2	0	50	50	
		Elective-II(Cluster C)						
		C1. PHP – MySql & Wordpress	3	3	25	75	100	
		PHP-MySql & Wordpress Lab	3	2	0	50	50	
C2. Advanced JavaScript : JQuery, Ajax, Angular JS & JSON	3	3	25	75	100			
Advanced JavaScript Lab	3	2	0	50	50			
		Project – 2	5	5	25	75	100	

Andhra Pradesh State Council of Higher Education
B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS
w.e.f.2015-2016 (Modified in April 2016)
Structure of Computer Science/Information Technology (IT) Syllabus

UNIT – IV:

The Transport Layer: The Transport Service, Elements of Transport Protocols, Congestion Control Algorithms, The Internet Transport Protocols, The Internet Transport Protocols: TCP, Delay Tolerant Networks.

UNIT – V:

The Application Layer: DNS – The Domain Name System, Electronic Mail, The World Wide Web, Real Time Audio & Video, Content Delivery & Peer-to-Peer.

Reference Books:

1. Andrew S. Tanenbaum, “Computer Networks”, Fifth Edition, Pearson Education.
2. Bhushan Trivedi, Computer Networks , Oxford University Press
3. James F.Kurose, Keith W.Ross, “Computer Networking”, Third Edition, Pearson Education
4. Behrouz A Forouzan, “Data Communications and Networking”, Fourth Edition, TMH (2007).
5. Kurose & Ross, “**COMPUTER NETWORKS**” – A Top-down approach featuring the Internet”, Pearson Education – Alberto Leon – Garciak.

Student Activity:

1. **Study the functioning of network devices available in your organization .**
2. **Prepare a pictorial chart of LAN connections in your organization**

Andhra Pradesh State Council of Higher Education
Structure of B.Sc Botany under CBCS
w.e.f. 2015-16 (Revised in April, 2016)

<i>Year</i>	<i>Semester</i>	<i>Paper</i>	<i>Title</i>	<i>Hours</i>	<i>Marks</i>	<i>Credits</i>		
I	I	I	Microbial Diversity , Algae and Fungi	4	100	03		
			Practical –I	2	50	02		
	II	II	Diversity Of Archaeogoniates & Anatomy	4	100	03		
			Practical –II	2	50	02		
II	III	III	Plant taxonomy &Embryology	4	100	03		
			Practical –III	2	50	02		
	IV	IV	Plant physiology & Metabolism	4	100	03		
			Practical –IV	2	50	02		
III	V	V	Cell Biology, Genetics &Plant breeding	3	100	03		
			Practical –V	2	50	02		
		VI	VI	Plant Ecology & Phytogeography	3	100	03	
				Practical –VI	2	50	02	
		Any one paper from (A), (B) and (C) can be selected	VII (A)	VII (A)*	Elective	3	100	03
					Lab	2	50	02
	VII (B)*		VII (B)*	Elective				
				Lab				
	VII (C)*		VII (C)*	Elective				
				Lab				
	VI	**Any one cluster (Set of Three Papers) from VIII-A or VIII-B can be selected	** VIII-A	Cluster Elective-A	3	100	03	
				VIII-A-1	3	100	03	
			VIII-A-2	3	100	03		
			VIII-A-3	2	50	02		
			Or	2	50	02		
			** VIII-B	Cluster Elective-B				
			VIII-B-1					
			VIII-B-2					
VIII-B-3								

II B.Sc BOTANY - SEMESTER-III**Paper-III: PRACTICAL****Plant Taxonomy and Embryology**

Total hours of laboratory Exercises 30hrs @ 2 per week

Suggested Laboratory Exercises:

1. Systematic study of locally available plants belonging to the families prescribed in theory syllabus.
 2. Demonstration of herbarium techniques.
 3. Structure of pollen grains using whole mounts (*Catharanthus, Hibiscus, Acacia, Grass*).
 4. Demonstration of Pollen viability test using *in-vitro* germination (*Catharanthus*).
 5. Study of ovule types and developmental stages of embryo sac using permanent slides /Photographs.
 6. Structure of endosperm (nuclear and cellular); Developmental stages of dicot and monocot Embryos using permanent slides / Photographs
 7. Isolation and mounting of embryo (using *Symopsis / Senna / Crotalaria*)
 8. Field visits .
 9. Study of local flora and submission of Field Note Book.
-

A.P. State Council of Higher Education
Revised Common Framework of CBCS for Colleges in Andhra Pradesh
w.e.f. 2015-16, Revised in April, 2016

Table-7: B.Sc., SEMESTER – I

Sno	Course	Total Marks	Mid Sem Exam*	Sem End Exam	Teaching Hours	Credits
1	First Language (Tel/Hin/Urdu/Sans...)	100	25	75	4	3
2	Second Language English	100	25	75	4	3
3	<i>Foundation Course - 1</i> Human Values & Professional Ethics	50	0	50	2	2
4	<i>Foundation course -2</i> Environmental Studies	50	0	50	2	2
5	DSC-1 Paper-1 (Core)	100	25	75	4	3
6	DSC 1 Lab Practical	50	0	50	2	2
7	DSC 2 Paper-1 (Core)	100	25	75	4	3
8	DSC 2 Lab Practical	50	0	50	2	2
9	DSC 3 Paper-1 (Core)	100	25	75	4	3
10	DSC 3 A Lab Practical	50	0	50	2	2
	Total	750	-	-	30	25

#DSC: Domain (Subject) Specific Course (Paper)

Foundation Course: value or skill based

Note: For Science Domain Subjects which had no lab practical component earlier (eg. Mathematics) the following format is applicable. They, however, will have co-curricular activities (eg. Problem solving sessions etc.). The total marks will change accordingly for such combinations. For example for Maths, Physics and Chemistry the total marks will be 700.

	DSC (without Lab Practical)	100	25	75	6	5
--	-----------------------------	-----	----	----	---	---

*Mid sem exam at the college (The marks split between Formal Test and Co-curricular activities may be decided by the University concerned). End Sem Exam by the Univ.

*Practical component will not be applicable to those science subjects which had no such component earlier (ex. Mathematics)

**Syllabus size shall be in accordance with the number of teaching hours

(or)

b) Describe determination of Minimum Inhibitory Concentration (MIC) of an antibiotic for its use

AP STATE COUNCIL OF HIGHER EDUCATION
CBCS PATTERN FOR MICROBIOLOGY

YEAR	SEMESTER	PAPER	TITLE	MARKS	CREDITS
I	I	MBT 101	Introduction to microbiology and microbial diversity	100	
		MBP 101	Introduction to microbiology and microbial diversity	50	
	II	MBT 201	Microbial biochemistry and metabolism	100	
		MBP 201	Microbial biochemistry and metabolism	50	
II	III	MBT 301	Microbial genetics and Molecular biology	100	
		MBP 301	Microbial genetics and Molecular biology	50	
	IV	MBT 401	Immunology and Medical Microbiology	100	
		MBP 401	Immunology and Medical Microbiology	50	
III	V	MBT 501	Environment and Agriculture Microbiology	100	

		MBP 501	Environment and Agriculture Microbiology	50	
		MBP 601	Microbial Diagnosis in Health Clinics	100	
		MBP 601	Microbial Diagnosis in Health Clinics	50	
	VI	*MBT 701	Food and Industrial Microbiology	100	
	* Any one from 701, 702 & 703	*MBP 701	Food and Industrial Microbiology	50	
		*MBT 702	Microbial biotechnology	100	
		*MBP 702	Microbial biotechnology	50	
		*MBT 703	Microbial quality control, Instrumentation and biotechniques	100	
		*MBP 703	Microbial quality control, Instrumentation and biotechniques	50	
	** Any one cluster from 801, 802 & 803	**MBT 801	1. Industrial Microbiology 2. Food microbiology 3. Management of human microbial diseases	100 100 100	
		**MBP 801	Industrial Microbiology: Practical 1 Food microbiology :Practical 2 Management of human microbial diseases :Practical 3	50 50 50	
		**MBT 802	1. r – DNA technology 2. Microbes in sustainable agriculture 3. Bio fertilizers and Bio pesticides	100 100 100	
		**MBP 802	r – DNA technology: Practical 1	50 50	

			Microbes in sustainable agriculture: Practical 2	50	
			Bio fertilizers and Bio pesticides: Practical 3		
		**MBT 803	1. Biostatistics and Bioinformatics	100	
			2. Bio safety and Intellectual Property Right (IPR)	100	
			3. Drug design and discovery	100	
		**MBP 803	Biostatistics and Bioinformatics :Practical 1	50	
			Bio safety and Intellectual Property Right (IPR): Practical 2	50	
			Drug design and discovery: Practical 3	50	

AP STATE COUNCIL OF HIGHER EDUCATION

CBCS PATTERN FOR MICROBIOLOGY

B.Sc MICROBIOLOGY (CBCS) SYLLABUS

FIRST YEAR SEMESTER- I

MBT- 101 INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

TOTAL HOURS: 48

CREDITS: 4

UNIT-I

No. of hours: 12

History and mile stones in microbiology. Contributions of Anton von Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch, Ivanowsky. Importance and applications of microbiology. Classification of microorganisms. Haeckel's three Kingdom concept, Whittaker's five kingdom concept, three domain concept of Carl Woese. Outline

ANDHRA UNIVERSITY



Telegrams: UNIVERSITY
Telephone: 284 4000
Fax: 0891-2755324

No. L.II(3)/New Grading System/2016.

All Official letters, packages etc,
should be addressed to the
Registrar by designation and not
by name.

Visakhapatnam
Dt: 21-03-2016

PROCEEDINGS OF THE VICE-CHANCELLOR

Sub: New Grading System and Examination Rules and Regulations for PG Courses in Arts, Commerce & Management Studies, Science & Technology, Engineering (UG & PG), Pharmaceutical Sciences, 3 & 5 Year LLB, LLM, M.Phil and Ph.D Programmes with effect from the admitted batch of 2015-16 - Orders - Issued.

Read:1. Minutes of the Meeting of the Academic Senate held on 30-03-2015 (Vide ItemNo.26).
2. Proceedings of the Vice-Chancellor dated 13-01-2016.

ORDER:

In partial modifications of Proceedings under read (2) above, the Hon'ble Vice-Chancellor has ordered that the New Grading Table suggested by the University Grants Commission, New Delhi under Choice Based Credit System and Examination Rules and Regulations be implemented for all Post Graduate Programmes in Arts, Commerce & Management Studies, Science & Technology, Engineering (UG & PG), Pharmaceutical Sciences, 3 & 5 Year LLB, LLM, M.Phil and Ph.D programmes with effect from the admitted batch of 2015-16.

TABLE

S.No.	Range of Marks%	Grade	Grade Points	
01.	> 90 ≤ 100	O	10	Out Standing
02.	> 80 ≤ 90	A+	9	Excellent
03.	> 70 ≤ 80	A	8	Very Good
04.	> 60 ≤ 70	B+	7	Good
05.	> 55 ≤ 60	B	6	Above Average
06.	≥ 50 ≤ 55	C	5	Average
07.	≥ 40 < 50	P	4	Pass
08.	< 40	F	0	Fail
09.			0	Ab (Absent)

1. CGPA will be calculated from II semester onwards upto the final semester. CGPA multiplied by "10" gives aggregate percentage of marks obtained by a candidate.

2. **Examination Rules and Regulations:**

Terms used and their explanation:

Credit Point: It is the product of grade point and number of credits for a course.

Credit: A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.

Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F

Award of Degree and Diplomas:

B.Tech. / B.Arch. / B.Pharm. / M.Sc. 5-Year Integrated Courses :

A candidate shall be declared to have passed in a subject / paper, if the candidate secures a minimum of 'P' grade in theory examination and a minimum of 'C' grade in practical examination / Project / Field Work / Viva-Voce / Industrial Training.

Further, a candidate has to secure a minimum of 40% in theory examination (excluding sessional marks) and a minimum of 50% (excluding sessional marks) in the practical examination / Project / Field Work / Viva-Voce./ Industrial Training in Semester-end / Year-end examinations and 50% aggregate to pass.

Further, a candidate has to secure a minimum of 5.0 SGPA for a pass in each semester.

P.G. in Engineering (M.E/M.Tech)/M.C.A/M.Sc Computer Science Courses:

A candidate shall be declared to have passed in a subject / Paper, if the candidate secures a minimum of 'C' Grade in theory examination and a minimum of 'C' grade in practical examination / Project / Field Work / Viva-Voce / Industrial Training.

Further, a candidate has to secure a minimum of 40% in theory examination (excluding sessional marks) and a minimum of 50% (excluding sessional marks) in the practical examination / Project / Field Work / Viva-Voce / Industrial Training in Semester-end / Year-end examinations and 50% aggregate to pass.

Further, a candidate has to secure a minimum of 6.0 SGPA for a pass in each semester.

P.G in Pharmacy, Sciences and LLM Courses:

A Candidate shall be declared to have passed in a subject/ Paper, if the candidate secures a minimum of 'C' Grade in theory examination and a minimum of 'C' grade in practical examination / Project / Field Work / Viva-Voce / Industrial Training, etc., to secure a pass.

Further, a candidate has to secure a minimum of 40% in theory examination (excluding sessional marks) and a minimum of 50% (excluding sessional marks) in the practical examination / Project / Field Work / Viva-Voce / Industrial Training in Semester-end / Year-end examinations and 50% aggregate to pass.

Further, a candidate has to secure a minimum of 5.0 SGPA for a pass in each semester.

Further, a failed candidate will be permitted to appear in any subject / paper to secure a minimum prescribed grade to enable the candidate to pass at the end of any semester / year-end examination.

There is no provision for improvement for sessional marks alone. However if the candidate wants to improve the sessional marks, the candidate has to seek readmission for all subjects in that particular semester.

There are no minimum marks for sessional.

Award of Degree and Diplomas for Arts, Commerce, Law and M.A.5 Year Integrated Courses:

A candidate shall be declared to have passed in a subject/paper if the candidate secures a minimum of "P" grade in theory and a minimum of 'C' in practical examination/project/field works /viva.

Further, a candidate has to secure a minimum of 40% in theory examination (excluding sessional marks) and a minimum of 50% (excluding sessional marks) in the practical examination / Project / Field Work / Viva-Voce / Industrial Training in Semester-end / Year-end examinations and 50% aggregate to pass.

Minimum Qualification for Physically Challenged:

10% reduction of marks in each semester in each subject will be allowed for Physically Challenged candidates against the prescribed minimum to secure a pass.

Award of marks by Grafting:

The application of grafting will be extended only to the candidate who secures a required a pass after affecting of rule of graft. Grafting will be done from other Theory / Practical External Examination Papers Only. Grafting will not be allowed from Sessional Marks.

Grafting will be awarded for Theory, Lab including sessional marks for not more than two subject / papers in semester-end / year-end examinations.

Grafting of maximum 2 (two) marks will be allowed to qualify (i.e. 50%) the M. Phil. / Pre-Ph.D. examination with effect from January 2015 exams.

There are no grace marks.

The credits of audit courses are not counted for SGPA/CGPA calculation.

Revaluation:

The candidate has to apply for revaluation on or before 15 days from the date of publication of the results.

Betterment:

A candidate can avail the betterment chances during the validity of all the courses.

Classification of successful candidates is based on CGPA as follows :

Arts,Commerce(PG) & LLB / PG Diplomas/Diplomas/ M.A.5 Year Integrated Courses

Distinction	-	CGPA 7.0 or more
I Class	-	CGPA 6.0 or more but less than 7.0
II Class	-	CGPA 5.0 or more but less than 6.0
Pass	-	CGPA 4.0 or more but Less than 5.0

Science, Engineering, Pharmacy (UG/PG)/LLM/PG Diplomas:

Distinction	-	CGPA 7.0 or more
I Class	-	CGPA 6.0 or more but less than 7.0
II Class/Pass	-	CGPA 5.0 or more but less than 6.0

M.E/M.Tech., MCA/M.Sc(CS):

Distinction	-	CGPA 7.0 or more
I Class	-	CGPA 6.0 or more but less than 7.0

M. Phil./Pre-Ph.D:

Distinction	-	CGPA 7.0 or more
I Class	-	CGPA 6.0 or more but less than 7.0
II Class/Pass	-	CGPA 5.0 or more but less than 6.0

Attendance:

A candidate is required to put up a minimum of 75% of attendance to be eligible to write the semester or year-end examination.

A candidate is permitted to write the examination on medical grounds if the attendance is between 66% and 74%, on payment of condonation fee of Rs.1,000/- (Rupees one thousand only).

If the attendance is less than 66%, the candidates are not eligible to write the examination and they should repeat the semester / year along with the next batch or before the expiry of transitory regulations, as the case may be.

Even if a candidate is having more than 74% of attendance, and if he/she has not paid the examination he/she will not be permitted to write the examination.

However, they will be allowed to study next semester / year, after taking prior approval from the Hon'ble Vice-Chancellor.

If the candidate is detained due to lack of required attendance, he/she has to repeat the course. He/she will not be permitted to the subsequent semester unless he/she completes the detained semester / year.

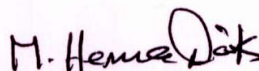
General Rules:

The candidate who secures less than prescribed SGPA/CGPA may be permitted to appear for the examination within the duration of the course or before the expiry of transitory regulations.

Failed candidates will be permitted to appear for the University examinations after the expiry of transitory regulations as per the existing regulations, scheme and syllabi which are in force.

Ranks will be given only to the candidates who have passed all the subjects/papers at a time. However, distinction will be given to the candidates who secure 70 per cent and above those who have passed all the subjects / Papers at a time.

(BY ORDER)



**(M. HEMA NAIK)
Deputy Registrar (Academic)**

Copies to:

- The Principals of A.U. Campus Colleges, Visakhapatnam.
- The Special Officers of A.U. Campus Centers, VZM., KKD., & T.P. Gudem.
- The Faculty Chairman / Chairpersons of Arts, Commerce and Management Studies, Law, Science and Technology, Engineering and Pharmaceutical Sciences, A.U., VSP.
- All the Chairmen/Chairpersons, Boards of Studies in Arts, Commerce and Management Studies, Law, Science and Technology, Engineering and Pharmaceutical Sciences, A.U., VSP.
- All Heads of the Departments of A.U. Campus Departments.
- The Dean Academic Affairs, A.U., VSP.
- The Dean of Examinations (UG. & P.G), A.U., VSP.
- The Principals of Affiliated Colleges offering PG. and Professional courses, A.U., VSP.
- The Coordinator, A.U., Computer Centre, A.U., VSP.
- The Controller of Examinations, A.U., VSP.
- The Superintendents of E.V, E.I.VI, E.VII and E.VIII sections for information necessary action.
- The Web Master, Office of the Website, A.U., VSP.
- The Secretary to Vices-Chancellor, Steno to Rector & P.A. to Registrar.