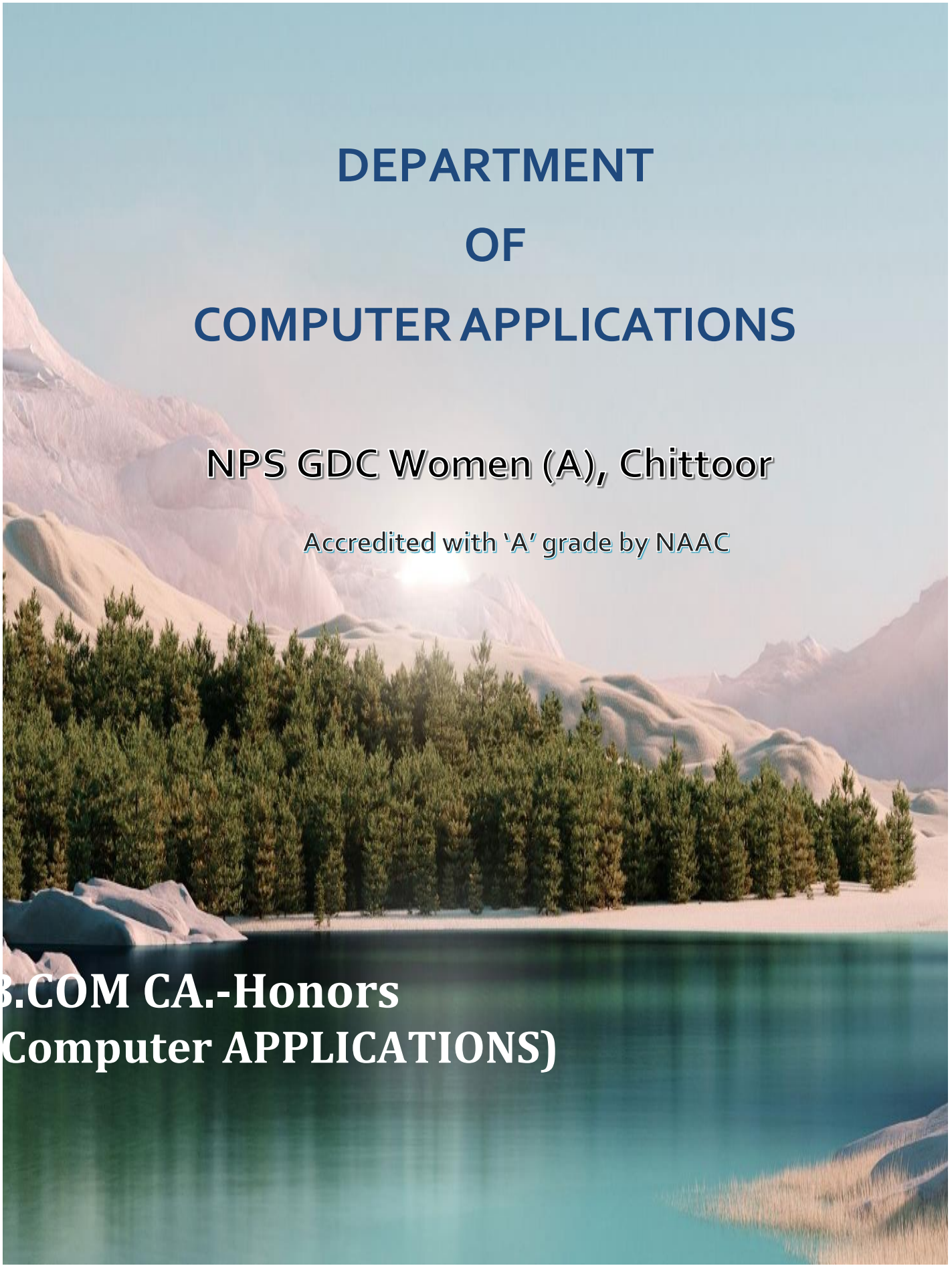

DEPARTMENT
OF
COMPUTER APPLICATIONS

NPS GDC Women (A), Chittoor

Accredited with 'A' grade by NAAC

.COM CA.-Honors
Computer APPLICATIONS)

ACADAMIC CELL, NPS GDC Women(A)
Chittoor

Proceedings of the Principal, NPS Govt. Degree College for Women(A), Chittoor
Present: Dr. K. Manohar

Rc.No.CA-02/NPSGDCW/UG-BoS/ Bacthes:2025-28 and 2026-29, dt. 14-08-2026

Subject: NPS GDC Women(A), Chittoor – UG Board of Studies (BoS) – Nomination of Members – Orders issued.

Ref.: 1. UGC Guidelines of for Autonomous Colleges – 2023.
2. Proc. Of the VC No: SVU/C-III (3)/BOS/Smt. NPS. Govt. Coll/Chi/2025 dt. 09-05-2025
3. Rc.No.CA-01/NPSGDCW/UG-BoS/2025-26 dt. 22-09-2025

***

Order

The Principal, NPS GDC Women(A), Chittoor, is pleased to nominate the following members to UG Board of Studies to frame the syllabus of **Computer Applications** courses in all the semesters duly following the norms of the UGC regulations for the Autonomous Colleges 2023.

Sl.No.	Name	Designation
1	Smt. Y. Jnapika	Chairperson
2	Smt. K. Srilatha	Member
3	Smt. M. Padmavathi	Member
4	Sri T. Subramanyam	University Nominee
5	Smt. G. Satya Suneetha	Local Nominee
6	Dr. G. Dayanandam	Local Nominee
7	Sri. Murali Mohan M	Industrial Nominee
8	Sri. Y. Srinivasulu	Subject/Special Course Expert
9	Kum. M. Ramya	Alumni Student

The above members are requested to attend the BoS meetings for the Autonomous UG-Batches **2025-26(3rd & 4th Semesters)** and UG-Batch **2026-27(1st & 2nd Semesters)** during A.Y 2026-27 and share their valuable views, suggestions on the following functionaries.

a) Prepare syllabus for the subject keeping in view the objectives of the college, interest of the stakeholders and National recruitment for consideration and approval of the IQAC and Academic Cell.
b) Suggest methodologies for innovative teaching and evaluation techniques
c) Suggest the panel of names to the Academic council for appointment of Examiners
d) Coordinate research, teaching, extension and other activities in the department of the College.
e) Suggest CLO, PLO and subject experts to develop question bank in compliance with Bloom's Taxonomy.

The above said members are requested to bestow their services for the successful organization of the event.

PRINCIPAL
Principal
Smt. N.P.S.Govt. College for Women
CHITTOOR-517002.(A.P.).

DEPARTMENT OF COMPUTER SCIENCE

COMPOSITION OF BOARD OF STUDIES FOR THE A.Y. 2026-27 [R25 Cirriculum]

Sl.No.	Category	Name & Designation	Chairperson/ Member
1	Chairman	**Smt. Y Jnapika** Head of the Department Dept. of Computer Science Smt. N.P.S GDC for Women(A) Chittoor.	**Chairperson** Mobile: 8341341943 Email: jnapikagdl@gmail.com
2	Members of the Department	**1. Smt. K. Srilatha** Lecturer in Computer Applications Smt. N.P.S GDC for Women(A) Chittoor. **2. Smt. M. Padmavathi** Lecturer in Computer Science Smt. N.P.S GDC for Women(A) Chittoor.	**Faculty** Mobile: 7893082602 Email: kadimi.srilatha80@gmail.com **Faculty** Mobile: 9985057603 Email: padma.manikyavelu@gmail.com
3.	Two Experts in the Subject from outside the Parent University to be nominated by Academic council	**1. Smt. G. Satya Suneetha** Lecturer in Computer Applications Government Degree College, Kovvur, E.G. Dt **2. Dr. G. Dayanandam** Lecturer in Computer Science Government Degree College, Kodur(RS), Annamayya Dt 516101	**Subject experts** **Mobile: 9491215695** **Email:** **satyasuneetha10@gmail.com** **Mobile: 9885553539** **Email:** gdayanandam@gdcrlkoduru.e**du.in**
4.	One expert from to be nominated by the Vice-Chancellor from the panel of six recommended by Autonomous College Principal	**Sri T. Subramanyam** Lecturer in Computer Science GDC(A), Nagari, Chittoor	**Subject experts by University** Mobile: 9000305427 Email: sbmtupakula@gmail.com
5.	One Representative from the Industry/ Corporate Sector	**Murali Mohan M** Principal Software Engineer CommScope, Bangalore	**Industry Expert** Mobile: 9739745424 Email: murali.mandala@commscope.com
6.	Experts from outside Autonomous College (Special Courses)	**Sri. Y. Srinivasulu** Lecturer in Computer Applications Dr. YSR GDC, Vedurukuppam S V University.	**Special Courses Expert** Mobile: 9985883900 Email id: srinivasulu120@gmail.com
	One Meritorious Alumni nominated by the Principal	**M. Ramya** ABPM at SO (Assistant Branch of Post Master) Mogili Venkatagiri, Bangarupalyam.	**Alumni Student** Mobile: 9900175354 Email id: muderamya123@gmail.com

Signature of the Members **Signature of the BOS Chairman**

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DEPARTMENT OF COMPUTER APPLICATIONS

Board of Studies Meeting- 2 Dated: 17-08-2026

Meeting-2 of the Board of studies is held at NRC Room for the Department of Computer Science, NPS GDC Women (A), Chittoor with the following agenda.

Agenda

- Curriculum Design for all the III & IV Semesters for B.com. (Honors)-Computer applications for R25 Syllabus.
- Designing of Course Outcomes and Course Objectives
- Identifying /inclusion of components of Skill Development, Employability and Entrepreneurship in the curriculum
- Additional inputs into the curriculum
- Designing Model Question Papers and identifying potential paper setters
- Innovative Teaching – Learning Methodology (Learner Centric)
- Curriculum for the Certificate Courses
- Academic activities of the Department
- Any other proposal with the permission of the chair

(Smt. Y Jnapika)
CHAIRPERSON
BOARD OF STUDIES

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Minutes and Resolutions

The BOS Team have given the following inputs on the BOS Meeting-1:

- In the Course-2 "Fundamentals of Information Technology & Office Automation (25BCA102T)" of semester-1, suggested to remove the topic "Evolution of Computers: History from early mechanic devices to modern-day systems" from unit -I as it is interlinked with same unit - I as Generations of Computers.
- In the Course-2 "Fundamentals of Information Technology & Office Automation (25BCA102T)" of semester-1, suggested to remove the topic "Key Components: Nodes, Links, Protocols, Networking Devices and Internet Basics: Search engines, Internet Security" in unit-II as required and emphasized in further courses later.
- In the Course-2 "Fundamentals of Information Technology & Office Automation (25BCA102T)" of semester-1, suggested to remove the topic "References and Citations: Footnotes, endnotes, and captions, Bibliography and citation tools, Table of contents and index creation." in unit-III.
- In the Course-2 "Fundamentals of Information Technology & Office Automation (25BCA102T)" of semester-1, suggested to remove the topic "Conditional formatting: Data Bars, Color Scales, Icon Sets, Custom Formulas." in unit-IV.
- In the Course-4 "E-Commerce and Web Application and Development (25BCA204T)" of semester-2, suggested to remove "Commerce Business Models: Revenue models (advertising, subscription, etc.)" from unit-1, to avoid ambiguity.
- In the Course-4 "E-Commerce and Web Application and Development (25BCA204T)" of semester-2, suggested to remove "Inline frames, HTML Forms. Embedding multimedia objects." from unit-2, to avoid ambiguity.
- In the Course-4 "E-Commerce and Web Application and Development (25BCA204T)" of semester-2, suggested to remove "Carousels-Creating image sliders." from unit-5, as it is good to study in advanced Web designing.

The above suggestions are agreed by all the BOS members also incorporated while framing the UG syllabus for the B.Com., Computer Applications (Major) during first year. The approved syllabus is followed from A.Y.2025-26. **The same regulation R25 Syllabus is followed and continued till next regulation is formulated.**

Signature of the Members **Signature of the BOS Chairman**

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Minutes and Resolutions

The BOS Team have given the following inputs on the BOS Meeting-2: (17-08-2026)

Signature of the Members **Signature of the BOS Chairman**

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CONSOLIDATED REPORT OF BOARD OF STUDIES FOR THE YEAR A.Y. 2026-27 [w.r.t R25]

The Meeting Board of Studies of Computer Science & Applications department was convened on 17-August-2026 under the Chairmanship of Smt, Y Jnapika Head / Lecturer-in-charge of Department of Computer Science and Applications. The following members are present

S.No.	Name	Designation	Signature
1	Prof. M. Humera Khanam	University Nominee	
2	Dr. G. Vijay Kumar	Local Nominee	
3	Manoj Prabhakar Darsi	Local Nominee	
4	Murali Mohan M	Industrial Nominee	
5	Smt. K. Srilatha Smt. M. Padmavathi	Faculty Members	
6	Sri. Shaik. Munwar	Subject/Special Course Expert	
7	S.J Aayesha	Alumni	
8	S. Sasikala	Student	

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Board of Studies Meeting-2 on 17-08-2026

DEPARTMENT OF COMPUTER SCIENCE

List of Paper Setters

S No	Name of the Paper Setter with Designation	Papers	Qualification	College - City
1	Sri. T Subramanyam Lecturer in Computer Science	ALL	M.Tech	Tech Dept of Computer Science, GDC, Nagari, SV University
2	Smt. G. Satya Suneetha Lecturer in Computer Applications	ALL	M.Tech	Dept of Computer Applications, Kovvur, E.G. Dt, AKN University
3	Dr. G. Dayanandam Lecturer in Computer Science	ALL	Ph.D.	Dept of Computer Science, Kodur (RS), Annamayya Dt, Yogi Vemana University
4	Sri. E. Murali Mohan Reddy Lecturer in Computer Applications	ALL	MCA	Dept of Computer Applications, Puttur, SV University
5	Dr. A. Ravi Prasad Lecturer in Computer Applications	ALL	Ph.D.	Dept of Computer Applications, Srikalahasti, SV University
6	Dr. A. Sri Lakshmi Lecturer in Computer Applications	ALL	Ph.D.	Dept of Computer Applications, Nagari, Autonomous
7	Sri. Y Srinivasulu Lecturer in Computer Applications	ALL	M.Tech	Dept of Computer Applications, Vedurukuppam, SV University
8	Smt. B. Durga Anuja Lecturer in Computer Applications	ALL	M.Tech	Dept of Computer Applications, Srikalahasti, SV University
9	Dr. S. Saravana Lecturer in Computer Applications	ALL	Ph.D.	Dept of Computer Applications, PVKN(A), Chittoor
10	Sri. T Narendra Babu Lecturer in Computer Applications	ALL	M.Tech	Dept of Computer Applications, Vedurukuppam, SV University
11	Sri. Shaik Munwar Lecturer in Computer Science	ALL	M.Tech	Dept of Computer Science, Vedurukuppam, SV University
12	Sri. Ismail Lecturer in Computer Science	ALL	M.Tech	Dept of Computer Science, Vedurukuppam, SV University
13	Dr. G. Vijay Kumar Lecturer in Computer Science	ALL	Ph.D.	Dept of Computer Science, Tanuku, W.G. Dt, AKN University
14	Manoj Prabhakar Darsi Lecturer in Computer Science	ALL	M.Tech (Ph.D.)	Dept of Computer Science, Nellore, Vikram Simhapuri University,
15	Smt. A. Sumathi Lecturer in Computer Science	ALL	M.Tech	Dept of Computer Science, Srikalahasti, SV University

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Board of Studies Meeting-2 on 17-08-2026

DEPARTMENT OF COMPUTER APPLICATIONS

List of Paper Examiners

S No	Name of the Examiner with Designation	Papers	Qualification	College - City
1	Sri. E. Murali Mohan Reddy Lecturer in Computer Applications	ALL	MCA	Dept of Computer Applications, Puttur, SV University
2	Sri. Y Srinivasulu Lecturer in Computer Applications	ALL	M.Tech	Dept of Computer Applications, Vedurukuppam, SV University
3	Smt. B. Durga Anuja Lecturer in Computer Applications	ALL	M.Tech	Dept of Computer Applications, Srikalahasti, SV University
4	Dr. S. Saravana Lecturer in Computer Applications	ALL	Ph.D.	Dept of Computer Applications, PVKN(A), Chittoor
5	Sri. T Narendra Babu Lecturer in Computer Applications	ALL	M.Tech	Dept of Computer Applications, Vedurukuppam, SV University
6	Sri. Shaik Munwar Lecturer in Computer Science	ALL	M.Tech	Dept of Computer Science, Vedurukuppam, SV University
7	Sri. Ismail Lecturer in Computer Science	ALL	M.Tech	Dept of Computer Science, Vedurukuppam, SV University
8	Smt. A. Sumathi Lecturer in Computer Science	ALL	M.Tech	Dept of Computer Science, Srikalahasti, SV University
9	Sri. T Subramanyam Lecturer in Computer Science	ALL	M.Tech	Tech Dept of Computer Science, GDC, Nagari, SV University
10	Dr. A. Ravi Prasad Lecturer in Computer Applications	ALL	Ph.D.	Dept of Computer Applications, Srikalahasti, SV University
11	Dr. A. Sri Lakshmi Lecturer in Computer Applications	ALL	Ph.D.	Dept of Computer Applications, Nagari, Autonomous

(**Smt. Y Jnapika**)
CHAIRPERSON BOARD OF STUDIES

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DEPARTMENT OF COMPUTER SCIENCE

SCHEME OF EVALUATION

MODEL OF SEMESTER END EXAMINATION QUESTION PAPER (THEORY)

(As Approved in the BOS meeting-1 held on **25-10-2025**)

EVALUATION SCHEME

Standard Operating Procedure for Continuous Internal Assessment (Internal Marks – 30). The Internal marks in all the courses/subjects will be awarded based on continuous internal assessment made during the semester concerned. For each Courses/subject 30 marks are allotted for internal assessment and 70 marks are allotted for the End Semester Examination.

Continuous Internal Evaluation (CIA):

It has been decided to introduce Continuous Internal assessment marks for a total of 60 marks, which are to be distributed as follows:

S.No.	Component			Distribution of Marks
1	CIE I (after completion of 50% of syllabus)			20
2	CIE II (Online Exam)			20
3	ATTENDANCE	Above 95%	5	5
		91% to 95%	4	
		86% to 90%	3	
		81% to 85%	2	
		75% to 80%	1	
		Below 75%	0	
Pedagogical Strategies				
4	Assignment			5
5	Participation or Paper Presentation in Student Seminars/Workshops/Group Discussions/ Quiz/ Student Study Project/Field Visit/Survey			5
6	Swatch Bharat (Clean & Green)			5
TOTAL				**60**

The total 60 Marks is scaled down to 30 Marks

Component I: CIE I & CIE II (20+20 = 40 Marks)

Two Internal Examinations, out of which one is Mandatorily Online examination, for each Course shall be conducted for assessment. These examinations will be conducted during August/September (CIE –I) and January/February (CIE-II). CIE-I carries 20 marks and CIE-II carries 20 marks. CIE- I will be conducted after completion of 50% of syllabus. The second internal examination, i.e., CIE – II, which will cover the remaining second half of the syllabus. The sum of both the CIEs will be considered for awarding marks for CIA.

Suggestive Question Paper Pattern for CIE I & CIE II (Based on Blooms Taxonomy):

Though the faculty concerned is empowered to adopt their own pattern for question paper, a general and suggestive model for question paper is given below based on Blooms Taxonomy.

Q No	Learning Objective	Marks
1	Memory based (Remember)	3
2	Understand (Comprehension)	4
3	Application	4
4	Analysis	3
5	Evaluation	3
6	Creativity	3
	TOTAL	20 marks

The active verbs used to frame the question based on Blooms Taxonomy is given below for the convenience.

Active verbs developed based on Bloom's Taxonomy

Knowledge	Understand	Apply	Analyze	Evaluate	Create
define	explain	solve	analyze	reframe	design
identify	describe	apply	compare	criticize	compose
describe	interpret	illustrate	classify	evaluate	create
label	paraphrase	modify	contrast	order	plan
list	summarize	use	distinguish	appraise	combine
name	classify	calculate	infer	judge	formulate
state	compare	change	separate	support	invent
match	differentiate	choose	explain	compare	hypothesize
recognize	discuss	demonstrate	select	decide	substitute
select	distinguish	discover	categorize	discriminate	write
examine	extend	experiment	connect	recommend	compile
locate	predict	relate	differentiate	summarize	construct
memorize	associate	show	discriminate	assess	develop
quote	contrast	sketch	divide	choose	generalize
recall	convert	complete	order	convince	integrate
reproduce	demonstrate	construct	point out	defend	modify
tabulate	estimate	dramatize	prioritize	estimate	organize
tell	express	interpret	subdivide	find errors	prepare
copy	Identify	Manipulate	survey	grade	produce
discover	indicate	Paint	advertise	measure	rearrange
duplicate	Infer	Prepare	appraise	predict	rewrite
enumerate	relate	produce	Break down	rank	role-play

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Important Note:

Students who absent themselves from any CIE will lose the marks for the respective test. However, if a student is not able to write the CIE I / II because of his/her participation in an important event related to NSS/NCC or Games/Sports representing the College/University/health grounds, the student has to get the prior permission of the Principal through the proper channel and submit the same to the Office of the Controller of Examinations. Deadline is 7 days after the CIE. Applications submitted after the deadline will not be considered for the retest.

Component III: Attendance (5 Marks)

Attendance mark will be awarded to the students based on their attendance percentage on a particular course. Faculty of each course has to award the attendance mark based on their subject attendance.

The marks split-up is given below

Above 95%	5
91% to 95%	4
86% to 90%	3
81% to 85%	2
75% to 80%	1
Below 75%	0

Component IV: Assignment (5 Marks)

One Assignment for each course must be submitted by a student in each semester. The marks allotted to this component will be awarded based on the performance of the student. The assignment topic may be assigned either individually or group. Assignment should be submitted by the student in the first half of the semester. Also maximum of 7 days should be given to students to submit the assignment. Assignments should be evaluated by the faculty concerned and the same to be verified by the student. The assignment should be kept in department for the Academic Audit by IQAC and also for external academic audit conducted by office of Commissionerate of Collegiate Education. The marks should be awarded by the faculty.

Component V (Pedagogical Strategies):

Participation /Paper Presentation in Student Seminars/Workshops/Group Discussions/ Quiz/ Student Study Project/Field Visit/Survey (5 Marks)

For this component, the marks will be provided to student, if he/she participate/win in the external college technical events. To score marks, the student has to participate / present papers related to

subject in the technical events organized in the other colleges/other departments in the college.

	Participation	Second Prize	First Prize / Best Paper
Workshop / Seminar / Technical Symposium	2	3	5
National / International Conference	3	4	5

In case of Classroom seminar, one seminar for each course must be presented by a student in each semester. Each student should be given individual topic for seminar; the student has to submit the seminar topic as assignment and the same will be presented minimum of 10 minutes in the class through ICT. The seminar presented by the student should be evaluated by the subject faculty and based on the performance of the presentation, the marks will be awarded.

Similarly, reports on field visits, educational tours, study projects in prescribed format will be considered for awarding marks in this component.
For a student who has not participated in any events in that semester, the student will be awarded "0" for this component. If a student participates more than one event and win prize, the best would be considered for the subject.

In case of Quiz, offline/online quiz, it should be conducted after the CIE II and well before the SEE. Faculty concerned has to announce the schedule for the quiz and conduct the quiz.

Semester End Examinations (SEE)

The question paper is of 2 ½ duration for 70 marks. The suggestive question paper model is given that may be used for framing the question. This kind of question paper will be helpful in CO-PO Mapping and thereby graduate attributes.

Curriculum 2025-28 [R25] Version: 2.0

R25 CIRRICULUM FRAMEWORK

Curriculum Framework of B.A/B.Com/BBA (Honours) from the A.Y. 2025-26 Major + Minor with CSP & VI Semester Internship				
1st Year - Semester I				
Sl.No	Category	Course No	No. of Hours*	No. of Credits
1	Major - Core	I	4	4
2	Major - Core	II	4	4
4	Minor	0	0	0
5	AECC - English	I	4	3
6	AECC - MIL (Telugu/Hindi/Sanskrit)	I	4	3
7	Multidisciplinary Course	0	0	0
8	Skill Enhancement Course (SEC) Intro' to Artificial Intelligence	I	4 + 2 (Practice)	4
End of Semester I of 1st Year		**5**	**22**	**18**
1st Year - Semester II				
Sl.No	Category	Course No	No. of Hours	No. of Credits
1	Major - Core	III	4	4
2	Major - Core	IV	4	4
3	Minor	0	0	0
4	AECC - English	II	4	3
5	AECC - MIL (Telugu/Hindi/Sanskrit)	II	4	3
6	Multidisciplinary Course	I	2	2
7	Skill Enhancement Course (SEC) Application of Artificial Intelligence (Discipline Specific)	II	4 + 2 (Practice)	4
8	Indian Knowledge System	I	2	0
9	Community Service Project (minimum of 80 hours with 1 Credits			1
End of Semester II of 1st Year		**7**	**26**	**21**
For B.Com courses, the number of instructional hours shall be five (5) for courses involving problem-solving, and four (4) for courses comprising only theory.				

Curriculum Framework of B.A/B.Com/BBA (Honours) from the A.Y. 2025-26 Major + Minor with CSP & VI Semester Internship				
2nd Year - Semester III				
Sl.No	Category	Course No	No. of Hours	No. of Credits
1	Major - Core	V	4	4
2	Major - Core	VI	4	4
3	Major - Core	VII	4	4
4	Minor	I	4	4
5	AECC (Creative Writing/Business Writing in English)	III	4	3
6	AECC (Creative Writing/Journalistic Writing in MIL - Telugu/Hindi/Sanskrit)	III	4	3
	Multidisciplinary Course	II	2	2
7	Skill Enhancement Course (SEC) Design Thinking/Problem Solving / Others	III	2	2
End of Semester III of 2nd Year		**8**	**28**	**26**

2nd Year - Semester IV				
Sl.No	Category	Course No	No. of Hours	No. of Credits
			Theory	Theory
1	Major - Core	VIII	4	4
2	Major - Core	IX	4	4
3	Major - Core	X	4	4
4	Minor	II	4	4
	Multidisciplinary Course	III	2	2
7	Skill Enhancement Course (SEC) Design Thinking/Problem Solving / Others	IV	2	2
End of Semester IV of 2nd Year		**6**	**20**	**20**
For B.Com courses, the number of instructional hours shall be five (5) for courses involving problem-solving, and four (4) for courses comprising only theory.				

Curriculum Framework of B.A/B.Com/BBA (Honours) from the A.Y. 2025-26 Major + Minor with CSP & VI Semester Internship				
3rd Year - Semester V				
Sl.No	Category	Course No	No. of Hours	No. of Credits
1	Major - Core	XI	4	4
1	Major - Elective	XII	4	4
2	Major - Elective	XIII	4	4
	Minor	III	4	4
4	Minor	IV	4	4
	Environmental Education	I	2	2
End of Semester V of 3rd Year		**6**	**22**	**22**
3rd Year - Semester VI				
Sl.No	Category	Course No	No. of Hours	No. of Credits
			Theory	Theory
1	Major - Elective	XIV	4	4
2	Major - Elective	XV	4	4
3	Minor	V	4	4
4	Minor	VI	4	4
5	Semester Internship (minimum of 180 hours with 3 Credits)			3
End of Semester VI of 3rd Year		**4**	**16**	**19**
For B.Com courses, the number of instructional hours shall be five (5) for courses involving problem-solving, and four (4) for courses comprising only theory.				

Credit Framework for 3-year UG Program

Credits for Major – 11 x 4 = 44 + 4 x 4 = 16. Total 60 Credits

Credits for Minor – 6 x 4 = 24 Credits

Credits for AECC (Languages) – 3 x 3 = 9 for Eng + 3 x 3 = 9 for MIL. Total = 18

Credits for Multidisciplinary Courses – 3 x 2 = 6 Credits

Credits for Skill Enhancement Courses – 2 x 4 = 8 for AI + 2 x 2 for others. Total 12 Credits

Credits for Value Added Courses – Env.Edn 2 Credits

Credits for Internships – 4 Credits

TOTAL CREDITS FOR 3-YEAR UG PROGRAMME – 126 Credits.

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Curriculum 2025-28 [R25] Version: 2.0

R25 COURSE STRUCTURE (MAJOR)

(Same As per APSCHE)

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

Model Syllabus for 4-Year UG Honours in B.Com. (Computer Applications) as Major in consonance with Curriculum framework w.e.f. AY 2025-26

COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
I	I	1	Business Organization and Management	4	4
		2	Fundamentals of Information Technology & Office Automation	3	3
			Fundamentals of Information Technology & Office Automation - Practical	2	1
	II	3	Financial Accounting I	4	4
		4	E-Commerce and Web Application and Development	3	3
			E-Commerce and Web Application and Development -Practical	2	1
II	III	5	Financial Accounting II	4	4
		6	Business Statistics	4	4
		7	Database Management System	3	3
			Database Management System-Practical	2	1
	IV	8	Advanced Accounting	4	4
		9	Cost and Management Accounting	4	4
		10	Data Science using Python	3	3
			Data Science using Python-Practical	2	1
III	V	11	Corporate Accounting	4	4
		12 A	Entrepreneurship & Start-Ups	4	4
			OR		
		12 B	Business Intelligence tools and Data Visualisation	3	3

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
			Business Intelligence tools and Data Visualisation-Practical	2	1
		13 A	Business Analytics Using Excel and Power BI	3	3
			Business Analytics Using Excel and Power BI-Practical	2	1
			OR		
		13 B	Accounting Information System	3	3
			Accounting Information System-Practical	2	1
	VI	14 A	Auditing	4	4
			OR		
		14 B	Financial Institutions and Markets	4	4
		15 A	Income Tax	4	4
			OR		
		15 B	Financial Planning	4	4

Note: In the III Year (during the V and VI Semesters), students are required to select a pair of electives from one of the **Two** specified domains. **For example: if set 'A' is chosen, courses 12 to 15 to be chosen as 12 A, 13 A, 14 A and 15 A**. To ensure in-depth understanding and skill development in the chosen domain, students must continue with the same domain electives in both the V and VI Semesters.

R25 COURSE STRUCTURE (MINOR)

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

Model Syllabus for Computer Applications (Minor) in consonance with Curriculum framework w.e.f. AY 2025-26

COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
II	III	1	Computer Fundamentals and Office Automation	3	3
			Computer Fundamentals and Office Automation-Practical	2	1
	IV	2	Database Management System	3	3
			Database Management-Practical	2	1
III	V	3	Introduction to Web Programming	3	3
			Introduction to Web Programming-Practical	2	1
		4	Fundamentals of Python Programming	3	3
			Fundamentals of Python Programming-Practical	2	1
	VI	5	Cyber Security	3	3
			Cyber Security-Practical	2	1
		6	Data Visualization using Tableau & Power BI	3	3
			Data Visualization using Tableau & Power BI-Practical	2	1

DEPARTMENT OF COMPUTER APPLICATIONS

SCHEME OF VALUATION FOR PRACTICAL EXAMINATIONS

(As Approved in the BOS meeting-1 held on **25-10-2025** for Autonomous **Batch 2025-2028**, the same is followed till next regulation is formulated)

S.No.	Description	Marks
1	Procedure Explanation with Coding (including Algorithm & Flowchart if any)	15
2	Execution of Program	10
3	VIVA VOCE	10
4	RECORD	15
	****Total Internal Marks****	50
5	EXTERNAL PRACTICAL EXAM (At the end of II, IV& VI Semester)	50
6	EXTERNAL PRACTICAL EXAM (At the end of I, III & V Semester)	50
	GRAND TOTAL	**100**

** Award of marks for number of practicals recorded in the Record.

10 Practicals and Above	10
8 Practicals	8
6 Practicals	6
5 Practicals	5
Less than 5	0

MAJOR

SEMESTER-III

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Curriculum 2025-28 [R25] Version: 2.0

Course Code	Title of the Course	L	S/ M	P	C
25BCA303T	**DATABASE MANAGEMENT SYSTEMS**	3			3
Prerequisites	Basic Computer Knowledge and Understanding of data and information				

COURSE OBJECTIVES	
1	To Understand the fundamental concepts of data, databases, and the architecture of Database Management Systems (DBMS).
2	To Implement database schemas using Entity-Relationship (E-R) and Extended E-R models.
3	To Apply relational database principles, including normalization and integrity constraints, to ensure efficient schema design.
4	To Execute SQL queries using DDL, DML, DCL and TCL
5	To Implement PL/SQL programming constructs and manage database transactions with a focus on ACID properties.

COURSE OUTCOMES		**BTL**
Upon successful completion of the course, the student will be able to:		
CO1	Differentiate between file systems and DBMS, and explain the evolution, architecture, and components of modern database systems.	Understanding
CO2	Sketch conceptual data models using E-R and Extended E-R diagrams.	Applying
CO3	Normalize relational schemas up to BCNF and apply relational algebra operations to query and manipulate data.	Applying
CO4	Query the database using DDL, DML, DCL, and TCL commands efficiently.	Applying
CO5	Construct PL/SQL blocks to programmatically access the database and manage transactions ensuring atomicity, consistency, isolation, and durability.	Analyzing

Syllabus

COURSE CONTENT	
UNIT I	**Overview of Database Management System** **Introduction**: Data, Information, Database, Database Management System, Database System Applications, File Systems versus DBMS, Advantages of DBMS. **Evolution of Database Systems**: Data Models, Data Abstraction, Database Architecture, Centralized and Client/Server Architectures for DBMSs, Database Users, Database Administrator, Components of DBMS, DBMS Vendors.
	Activity: Create a comparative presentation or infographic illustrating: a) File-based vs. DBMS approaches b) Types of DBMS architectures (1-tier, 2-tier, 3-tier) c) Data models and the three-schema architecture **Evaluation Method:** Rubric-based assessment of the presentation covering clarity, accuracy, and depth of comparison. Include a short quiz to test conceptual understanding.
UNIT II	**Database Design and the E-R Model** Overview of the Database Design Process, **The Entity-Relationship Model:** Entity Sets, Classification of Entity Sets, Attributes, Types of Attributes, Relationship, Relationship Set, Degree of a relationship set, Relationship Classification, Mapping cardinalities. **Extended Entity Relationship Model:** Specialization, Generalization, Constraints, Attribute Inheritance and ISA relationship, Aggregation. Case Study: Hospital Management System
	Activity: Model a university or hospital database using ER and Enhanced ER diagrams that shows: ● Entity sets, relationships ● Generalization/specialization ● Participation and cardinality constraints **Evaluation Method:** Diagram submission with peer review and instructor feedback. Use a checklist to assess completeness, correctness, and notation usage.
UNIT III	**Relational Database Design** **Relational Model:** Introduction to Relational Model, Concepts of Relation, Tuple, Attribute, Instance, Domain. Keys (Super key, Candidate Key, Primary Key, Foreign Key), Constraints (Domain constraints, Key constraints, Integrity constraints), selection, projection operations, Codd's rule set for relational databases. **Normalization:** Purpose of Normalization/ Schema refinement, Functional dependencies, **Normal Forms:** 1NF, 2NF, 3NF and BCNF, Denormalization. Case Study: College Student Enrollment System
	Activity: Normalize a given unstructured dataset up to 3NF. Then, write relational algebra expressions for sample queries. **Evaluation Method:** Written assignment graded on: **1.** Correctness of normalization steps **2.** Accuracy of relational algebra expressions **3.** Short-answer questions on CODD rules and relational calculus

UNIT IV	**Introduction to SQL** **Structured Query Language (SQL):** Overview of the SQL, Data types, Operators, Basic structure of SQL Query, **Commands:** Data Definition Language (DDL), Data Manipulation Language (DML), Data Control Language (DCL), Transaction Control Language (TCL). **Functions:** Numeric, String, Date Functions. Set operators, Aggregate functions, Nested queries, Joins, GROUP By Clause, ORDER By Clause, views. Case Study: Retail Store Database Management (Design and query a relational database for a retail store that manages products, customers, orders, and employees. Apply SQL concepts to extract insights, maintain data integrity, and support decision-making.)
	Activity: Implement a mini-project (e.g., Library or Inventory DB) using SQL. Include: 1. Table creation (DDL) 2. Data manipulation (DML) 3. Aggregation, joins, subqueries, views, and set operations **Evaluation Method:** Lab-based practical test with query execution and output validation. Include a viva to explain logic and optimization.
UNIT V	**Advanced SQL and Transaction Management** **PL/SQL:** Structure of PL/SQL block, Control Structures, Procedures, Functions, Exception handling, Cursors, Triggers. **Transactions:** Transaction concept, Simple transaction model, State diagram of a transaction, ACID properties: Atomicity, Consistency, Isolation, Durability.
	Activity: Build a PL/SQL-based payroll or student grading system using: ● Procedures and functions ● Control structures (IF, LOOP) ● Triggers for automated updates **Evaluation Method:** Code review and demonstration. Evaluate based on: ● Syntax correctness ● Logical flow

TEXT BOOKS	
1.	Database System Concepts, Avi Silberschatz, Henry F. Korth,S. Sudarshan, Seventh Edition, McGraw-Hill
2.	Database Management Systems by Raghu Ramakrishnan, McGrawhill
REFERENCE BOOKS	
1.	Fundamentals of Database Systems, Elmasri Navathe Pearson Education
2.	An Introduction to Database systems, C.J. Date, A.Kannan, S.Swami Nadhan, Pearson
WEB RESOURCES	
1.	https://www.scaler.com/topics/course/dbms/
2.	https://www.edx.org/learn/databases

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4
CO1	2	2	0	1	1	1	0	0	0	0	1	1	1	0
CO2	2	3	0	1	1	1	0	0	0	0	1	1	1	0
CO3	2	3	0	1	1	1	1	0	0	0	2	1	1	0
CO4	2	3	0	2	1	1	1	1	0	0	2	2	1	0
CO5	2	3	0	2	1	1	1	0	0	0	2	2	1	0

Model Blue print for the question paper setter

Sl. No.	UNIT-	Essay 10M	Short 4 M	Weightage
1	I	2	2	20%
2	II	2	2	20%
3	III	2	2	20%
4	IV	2	2	20%
5	V	2	2	20%
		100	**40**	**100%**

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II B.Com. (Hons) Computer Applications Semester-III

Recommended Format of Question Paper for all Courses

Time: 3 Hours **Max. Marks: 70**

Section-A

Answer any FIVE of the following questions. **5X4=20**

a) From Contents of Unit-I

b) From Contents of Unit-I

c) From Contents of Unit -II

d) From Contents of Unit -II

e) From Contents of Unit -III

f) From Contents of Unit -III

g) From Contents of Unit -IV

h) From Contents of Unit -IV

i) From Contents of Unit -V

j) From Contents of Unit -V

Section-B

Answer FIVE questions. **5X10=50**

k) A) From Contents of Unit-I

OR

B) From Contents of Unit-I

l) A) From Contents of Unit-II

OR

B) From Contents of Unit -II

m) A) From Contents of Unit -III

OR

B) From Contents of Unit -III

n) A) From Contents of Unit -IV

OR

B) From Contents of Unit -IV

o) A) From Contents of Unit -V

OR

B) From Contents of Unit –V

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DATABASE MANAGEMENT SYSTEMS

MODEL QUESTION PAPER (W.E.F 2025-2026)

Time: 3 Hrs. Max Marks: 70

Q. No	Question	Marks	BL	CO
	SECTION – B			
Answer any Five of the Following		**5 X 4 = 20M**		
1	Define DBMS. Explain advantages of DBMS.	4M	1	1
2	Explain file-based system and its disadvantages.	4M	2	1
3	Distinguish between weak entity and strong entity?	4M	2	2
4	List out the types of attributes in the ER model?	4M	1	2
5	Define primary key and candidate key?	4M	1	3
6	Explain in brief about Normalization?	4M	2	3
7	List different data types in SQL	4M	1	4
8	Explain different aggregate functions in SQL.	4M	2	4
9	Illustrate the structure of PL/SQL with examples.	4M	2	5
10	Explain about Exception handling in detail.	4M	4	5

SECTION – B				
Answer All Questions		**5 X 10 = 50M**		
11	a) Describe the 3-schema architecture with a neat diagram. (OR) b) Explain the components of DBMS?	10M 10M	1 2	1 1
12	a) Explain about degrees of relationship in ER Model with suitable example? (OR) b) Discuss about various constraints including generalization and specialization?	10M 10M	2 2	2 2
13	a) Explain about functional Dependency? Explain the difference between 3NF and BCNF? (OR) b) Summarize Integrity constraints over a relation.	10M 10M	2 2	3 3
14	a) Illustrate DDL and DML statements. (OR) b) Explain different operators used in SQL?	10M 10M	3 2	4 4
15	a) Demonstrate various types of Iterative controls in PL/SQL? (OR) b) Construct a PL/SQL program to show the working of procedures and functions	10M 10M	2 3	5 5

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Course Code	Title of the Course	L	S/M	P	C
25BCA303P	DATABASE MANAGEMENT SYSTEMS			2	1
Prerequisites	Basic Computer Knowledge and Understanding of data and information				

Objectives:

1. Learn basics of data, database systems.
2. Learn how to work with Oracle and SQLplus.

List of Experiments:

Experiment 1 : Database: Inventory Management

Table 1: Products

Structure:

Column Name	Data Type	Constraints
product_id	INT	PRIMARY KEY
product_name	VARCHAR(50)	NOT NULL
price	DECIMAL(10,2)	CHECK(price > 0)
stock_qty	INT	CHECK(stock_qty >= 0)

Sample Data:

product_id	product_name	price	stock_qty
1	Pen	10.00	100
2	Notebook	50.00	200
3	Stapler	120.00	50
4	Marker	25.00	80
5	File Folder	60.00	150

Table 2: Suppliers

Structure:

Column Name	Data Type	Constraints
supplier_id	INT	PRIMARY KEY
supplier_name	VARCHAR(50)	NOT NULL
contact_no	VARCHAR(20)	UNIQUE
product_id	INT	FOREIGN KEY REFERENCES Products(product_id)

Sample Data:

supplier_id	supplier_name	contact_no	product_id
101	StationeryMart	9876543210	1
102	PaperWorld	9876500000	2
103	OfficeSupplies	9876512345	3
104	MarkerHub	9876522222	4
105	FileDepot	9876533333	5

Section A: DDL (Data Definition Language)

1. Create a database called InventoryDB.
2. Create a table Products and table Suppliers with the specified columns and constraints:

Section B: DML (Data Manipulation Language)

3. Insert at least 5 rows into the Products table.
4. Update the stock quantity of product ‘Pen’ to 120.
5. Delete a supplier with a specific supplier_id.
6. Write a query to rename ‘Notebook’ to ‘NoteBook A4’

Section C: DQL (SELECT Queries)

7. Display all records from the Products table.
8. List all products that have a stock quantity less than 100.
9. Show all products between 20 and 100 price range.
10. Find the average price of products.
11. Display the total number of products in the inventory.

Section E: PL/SQL Programming

12. Write a procedure GetEmpInfo that takes emp_id as input and displays name, salary, and department.
13. Write a PL/SQL block that checks if an employee’s salary is above 50,000.
    If yes, print "High Salary"; Otherwise print "Standard Salary".
14. Write a PL/SQL program to display the top 10 rows in the Emp table based on their job and salary
15. Write a stored procedure Give Bonus that takes department ID and a designation as input, along with a bonus amount, and updates the salary of all employees in that department who have the specified designation by adding the bonus amount to their current salary.

SEMESTER-IV

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Curriculum 2025-28 [R25] Version: 2.0

Course Code	Title of the Course	L	S/M	P	C
25BCA403T	**DATA SCIENCE USING PYTHON**	3			3
Prerequisites	Basic Computer programming Knowledge				

COURSE OBJECTIVES	
1	To introduce students to the foundational concepts and significance of data science in modern business and technology contexts.
2	To develop proficiency in Python programming, focusing on data types, control structures, and core operations.
3	To equip students with skills in handling and manipulating structured and unstructured data using Python libraries.
4	To enable students to perform exploratory data analysis and data cleaning using tools like NumPy and Pandas
5	To foster the ability to visualize data effectively using Python libraries such as Matplotlib and Seaborn.

COURSE OUTCOMES		**BTL**
Upon successful completion of the course, the student will be able to:		
CO1	Understand the role of data science, its components, and its relationship with AI and machine learning.	Understanding
CO2	Apply Python programming constructs such as strings, lists, tuples, sets, and dictionaries to solve basic data problems.	Understanding
CO3	Demonstrate the ability to perform data manipulation and cleaning using NumPy and Pandas.	Applying
CO4	Execute exploratory data analysis and extract insights from datasets using Python based tools.	Applying
CO5	Survey data visualizations using Matplotlib and Seaborn to communicate analytical findings.	Analyzing

Syllabus

COURSE CONTENT	
UNIT I	**Introduction to Data Science** **Importance of Data Science:** Need for Data Science, What is Data Science? Data Science process, Business Intelligence and Data Science, Components of Data Science, Relationship between Artificial Intelligence, Machine Learning and Data Science. **Categories of Data:** Unstructured data, Structured data, Semi Structured data, Time series data, Sources of data: APIs, Web pages, Databases, Files, Taxonomy of types of data. **Data Scientist:** Responsibilities of a data scientist, Skills required for a data scientist, Programming and Analysis tools for Data Science. **Case Study:** Mapping Data Categories to Banking Operations.
	Activity: Conduct a group-based concept mapping session. Students collaborate to create a visual diagram showing connections among data science, AI, and machine learning. Each component (e.g., data analysis, modeling, tools like Python) is linked with explanations. **Evaluation Method:** Assess the concept maps on a 10-point scale based on Completeness of topics (20%), Accuracy of relationships (40%), Clarity and organization (20%) and Group discussion and presentation (20%)
UNIT II	Features of Python, writing and executing python program, Indentation, Constants, Identifiers, Variables, Keywords, Data types, Input/Output, Operators. Conditional statements, Looping Statements. **Strings:** Definition, Positive, Negative indexing, String slicing, String Operations: Concatenation, Repetition, Membership (in, not in), Comparison, String Methods: upper(), lower(), strip(), replace(), split(), join(), find(). **Lists:** Definition, Indexing, Slicing, Negative Indexing, Nested Lists, Modifying Lists: Updating, Inserting, deleting elements, List Functions: len(), max(), min(), sorted(), Looping through Lists.
	Activity: Give students a mini coding challenge: write a Python script to count word frequency in a paragraph using strings, lists, dictionaries, and sets. **Evaluation Method:** Evaluate on 1 10-point scale on the basis of: Correct use of each construct (40%), Code readability and comments (20%), Output accuracy (30%) and Bonus for optimized solutions (10%)
UNIT III	**Tuples:** Definition, Indexing, Slicing, Nested tuples, Tuple Operations: Concatenation, repetition, membership testing, Tuple Methods: count( ), index( ). **Sets:** Definition, Accessing Set elements, Modifying Sets, Set Operations: Union, Intersection, difference, Symmetric Difference. **Dictionaries:** Definition, Accessing elements, Modifying Dictionaries, Dictionary methods. **Functions:** User defined functions, built-in functions, lambda functions, recursive functions. **Modules:** math, random.
	Activity: Provide a messy dataset (e.g., with missing values, duplicates, incorrect formats). Ask students to clean and transform the data using NumPy and Pandas. **Evaluation Method:** Rubric includes: Identification of cleaning tasks (25%), Implementation correctness (40%), Use of appropriate functions and methods (20%), Final cleaned dataset quality (15%)

UNIT IV	**Exploratory Data Analysis:** What is EDA, Steps involved in EDA, Python Libraries used in EDA. **NumPy:** Basics, Array Attributes, Slicing (1D, 2D and 3D), NumPy Array Iteration, Operations on Arrays: Concatenating Arrays, Reshaping Arrays, Splitting Arrays, Statistical Operations on Arrays. **Pandas:** Basics, Series, Data Frame, Comparison between Series and Data Frame. Reading data from varied data sources into python **Data Frame:** Read from Excel Data Source, read data from .csv file, Read data from Dictionaries. **Data Cleaning:** Handling missing values, Removing duplicates, Correcting Inconsistencies. **Dataset Repositories for Data Science & Visualization:** Kaggle Datasets, UCI ML repository. **Case Study:** Retail Sales Analysis using Kaggle Dataset. Seaborn: Introduction, Comparison with matplotlib, Generating Plots: Heatmaps, Boxplots.
	Activity: Students choose a public dataset and perform an EDA process to uncover key trends and outliers. They document their observations in a Jupyter Notebook. **Evaluation Method:** Evaluated on: Depth of analysis (30%), Use of statistical summaries and visualizations (40%), Insightful interpretations (20%) and Notebook presentation quality (10%)
UNIT V	**Data visualization:** Introduction to Data Visualization, Benefits of Data Visualization, Popular Python Data Visualization Libraries. **Matplotlib:** Introduction, Basic Plots: Line plot, Bar chart, pie chart, Histogram, Scatter plot, **Plot Customization:** Titles, labels, and legends, Gridlines and ticks, Colors, markers, and line styles, Subplots and Layouts. Seaborn: Introduction, Comparison with matplotlib, Generating Plots: Heatmaps, Boxplots.
	Activity: Assign a storytelling task: create a data dashboard using Matplotlib and Seaborn that explains a specific trend (e.g., COVID-19 cases, sales over time). **Evaluation Method:** Evaluate on 1 10-point scale on the basis of: Correct use of chart types (25%), Visual appeal and clarity (25%), Annotation and labelling (20%), Connection to the narrative (30%)

TEXT BOOKS	
1.	Kooper, Steven. Data Science from Scratch. 2nd Edition. O'Reilly Media, 2019.
2.	Vasiliev, Yuli. Python for Data Science: A Hands-On Introduction. No Starch Press, 2022.
3.	Acharya, Seema. Reimagining Data Visualization Using Python. Chapman & Hall/CRC, 2022.
4.	VanderPlas, Jake. Python Data Science Handbook: Essential Tools for Working with Data.
REFERENCE BOOKS	
1.	Data Science and Analytics with Python. Chapman & Hall/CRC Data Mining and Knowledge Discovery Series, 2017.
2.	Nelson, Daniel. Data Visualization in Python. StackAbuse, 2020. Available via StackAbuse.
WEB RESOURCES	
1.	https://www.coursera.org/learn/python-data-science

2.	https://www.mltut.com/best-free-resources-to-learn-python-for-data-science/

CO-PO Mapping:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2	2	0	0	1	0	0	0	0	0	0	1	0	0
CO2	2	2	1	0	2	1	0	0	0	0	0	1	0	0
CO3	2	3	2	1	2	1	0	1	0	0	0	1	1	1
CO4	3	2	1	1	2	1	0	2	0	0	0	1	1	1
CO5	3	3	2	1	2	1	1	2	1	0	0	1	2	0

Model Blue print for the question paper setter

Sl.No.	**UNIT-**	**Essay 10M**	**Short 4 M**	**Weightage**
1	I	2	2	20%
2	II	2	2	20%
3	III	2	2	20%
4	IV	2	2	20%
5	V	2	2	20%
		100	**40**	**100%**

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II B.Sc. (Hons) Computer Applications Semester-IV

Recommended Format of Question Paper for all Courses

Time: 3 Hours **Max. Marks: 70**

Section-A

Answer any FIVE of the following questions. **5X4=20**

1. From Contents of Unit-I
2. From Contents of Unit-I
3. From Contents of Unit -II
4. From Contents of Unit -II
5. From Contents of Unit -III
6. From Contents of Unit -III
7. From Contents of Unit -IV
8. From Contents of Unit -IV
9. From Contents of Unit -V
10. From Contents of Unit -V

Section-B

Answer FIVE questions. **5X10=50**

11. A) From Contents of Unit-I

OR

B) From Contents of Unit-I

12. A) From Contents of Unit-II

OR

B) From Contents of Unit -II

13. A) From Contents of Unit -III

OR

B) From Contents of Unit -III

14. A) From Contents of Unit -IV

OR

B) From Contents of Unit -IV

15. A) From Contents of Unit -V

OR

B) From Contents of Unit –V

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Data Science using Python

MODEL QUESTION PAPER (W.E.F 2025-2026)

Time: 2 ½ Hrs. Max Marks: 70

Q. No	Question	Marks	BL	CO
	SECTION – A			
Answer any Five of the Following		**5 X 4 = 20M**		
1	Define Data Science and Business Intelligence?	4M	1	1
2	Discuss about Machine learning and Data science.	4M	2	1
3	Write a short note on variables and constants.	4M	1	2
4	Explain about string methods	4M	2	2
5	Discuss about Math and random modules.	4M	2	3
6	Explain any two tuple operations and methods?	4M	2	3
7	What is EDA and infer the steps in EDA?	4M	2	4
8	Compare Series and Data Frame	4M	2	4
9	Define Data visualization and label its benefits?	4M	1	5
10	Explain subplots and layouts.	4M	2	5

SECTION – B				
Answer All Questions		**5 X 10 = 50M**		
11	a) Explain about various categories of Data. (OR) b) Summarize the responsibilities and skills of a data scientist.	10M 10M	2 2	1 1
12	a) Discuss about Conditional and looping statements. (OR) b) Illustrate Lists in python with suitable examples?	10M 10M	2 3	2 2
13	a) Demonstrate how dictionaries are used in python? (OR) b) Explain about Sets in python with examples?	10M 10M	3 2	3 3
14	a) Discuss about Data Cleaning in detail? (OR) b) Explain about NumPy Arrays with examples?	10M 10M	2 4	4 4
15	a) What is data visualization libraries (OR) b) Explain in brief about following using Matplotlib: i) Charts ii) Plots	10M 10M	2 4	5 5

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Course Code	Title of the Course	L	S/M	P	C
25BCA403P	**Data Science using Python**			2	1
Prerequisites	Basic Computer Programming Knowledge				

Objectives:

1. Learn basics of python.
2. Learn how to work with python libraries.

List of Experiments:

1. Write a Python program to demonstrate basic data types in python.
2. Write a Python program to illustrate arithmetic operators.
3. Write a Python program to find the maximum of three numbers.
3. Write a Python Program to find the sum of digits of a number.
4. Write a Python Program to check whether a given number is palindrome or not.
5. Write a Python program to check whether a given number is prime or not.
6. Write a Python program to calculate Simple Interest and Compound Interest.
7. Write a Python program to illustrate Strings and String methods.
8. Write a Python program to illustrate string slicing.
9. Create a list and perform the following methods.
   a) append() b) extend() c) insert() d) pop() e) remove() f) clear
10. Create a list and perform the following functions.
    a) len( ) b) max( ) c) min( ) d) sorted( )
11. Write a program to input n numbers from the user. Store these numbers in a tuple.
    Print the maximum and minimum number from this tuple.
12. Create a dictionary and apply the following methods.
    a) Print the dictionary items b) Access items c) Use get( ) d) Use get( ) e) Use len( )
13. Write a Python program to find the factorial of a number using functions.
14. Write a Python program to find the factorial of a number using recursion.
15. Write a Python program to find the maximum of two numbers using lambda function.
16. Write a Python program to illustrate a *math* module.
17. Write a Python program to illustrate a *random* module.
18. Write a Python program to illustrate numpy array attributes: ndim, shape, size, dtype.
19. Write a Python program to illustrate numpy array statistical operations.
20. Write a python program to demonstrate Reading data from varied data sources into Pandas DataFrame.
    a) Read Data from Excel Data Source and display.
    b) Read Data from "iris.csv" into pandas DataFrame and display.[source: UCI ML repository]
    c) Load a Python Dictionary into a DataFrame.

21. Consider any Dirty Dataset for Data Cleaning [Source: Kaggle Dataset Repository] And perform the following.
    a) Remove Rows that contain empty cells.
    b) Clean Wrong Format.
    c) Clean Wrong Data.
    d) Remove Duplicates.
22. By using matplotlib generate Bar chart for revenue by product category.
23. By using matplotlib generate Pie chart for market share distribution of companies.
24. By using matplotlib generate Histogram for customer age distribution.
25. By using seaborn generate correlation Heatmap.
26. By using seaborn illustrate Boxplot.