

DIRECTION

No. 52/2021

Date : 14 / 10/2021

Subject : Examination leading to the Degree of B.E. in Artificial Intelligence & Data Science (Four Year Degree Course.... Semester Pattern) (Choice Based Credit System) in the Faculty of Science & Technology, Direction, 2021.

Whereas, Direction No. 29/2010 in respect of the Examinations leading to the degree of B.E./B.Text.E./B.Tech.(Chem.Engg.)/ B.Tech. (Chem.Tech.) (Polymer)(Plastic) Tech. (Common to all branches) (Four Year degree Course ... Semester Pattern .. Credit Grade System) courses in the Faculty of Engineering & Technology was in existence up to the session 2018-19 and abrogated stage wise vide Direction No. 26/2019,

AND

Whereas, Direction No. 26/2019 in respect of the Examinations leading to the degree of B.E./B.Text.E./B.Tech.(Chem.Engg.)/B.Tech.(Chem.Tech.) (Polymer)(Plastic) Tech. (Four Year degree Course ... Semester Pattern) (C.B.C.S.) courses in the Faculty of Science & Technology, Direction, 2020 was in existence and abrogated stage wise vide Direction No. 21/2020,

AND

Whereas, the letters from the Member Secretary, A.I.C.T.E., New Delhi dated 15/6/2020 and the Govt. Resolution from the Deptt.of Higher & Technical Education, Govt. of Maharashtra, Manralaya, Mumbai dated 13/8/2020 have been received regarding approval to the new Under-graduate Course B.E. in Artificial Intelligence & Data Science to the College B.N.College of Engineering, Pusad for the academic session 2020-21 ,

AND

Whereas, the letter from the Principal, B.N.College of Engineering, Pusad dated 24/8/2020 has been received regarding to accord the permission for starting the above Course as per approval of A.I.C.T.E. and the Govt. of Maharashtra to facilitate the First Year B.E. admissions from the academic year 2020-21 & onwards,

AND

Whereas, the University has granted affiliation to the new under-graduate Course B.E. in Artificial Intelligence & Data Science to the College B.N.College of Engineering, Pusad vide Notification No. 60/2020 dtd. 14.9.2020 from the academic session 2020-21 & onwards as per approval of A.I.C.T.E. and the Govt. of Maharashtra,

AND

Whereas, the Honøble Vice-Chancellor has constituted the Committee under the Chairmanship of the Board of Studies in Computer Science & Engineering for preparation of the Schemes of teaching & examination and draft provisions of the Course B.E. in Artificial Intelligence & Data Science as per A.I.C.T.E. Model Curriculum,

AND

Whereas, the Committee in its series of on-line meetings dated 14.12.2020, 08.01.2021 & 18.2.2021 recommended to apply the Scheme of teaching & examination of Semester I / II (Group A & B) which is common to all the branches of B.E./B.Text.E./B.Tech.(Chem.Engg.) and recommended the Schemes of teaching & examination of Semester III to VIII and draft provisions of the Course B.E. in Artificial Intelligence & Data Science (Four Year degree Course ... Semester Pattern) (Choice Based Credit System) as per A.I.C.T.E. Model Curriculum to the Faculty of Science & Technology to be implemented from the academic session 2020-2021 and onwards,

AND

Whereas, the Honøble Vice-Chancellor has accorded approval to the recommendations of the above Committee on behalf of the Faculty of Science & Technology and Academic Council on 31/3/2021 regarding implementation of Scheme of teaching & examinations of Semester I to VIII and draft provisions of the Course B.E. in Artificial Intelligence & Data Science (Four Year degree Course ... Semester Pattern) (Choice Based Credit System) as per A.I.C.T.E. Model Curriculum on behalf of the Faculty of Science & Technology and Academic Council under Sub Section (7) of Section 12 of M.P.U.Act, 2016 to be implemented from the academic session 2019-2020 and onwards,

AND

Whereas, the Scheme of teaching & examinations of Semester I to VIII of the Course B.E. in Artificial Intelligence & Data Science (Four Year degree Course ... Semester Pattern) (Choice Based Credit System) as per A.I.C.T.E. Model Curriculum are to be implemented from the academic session 2020-2021 and onwards,

AND

Whereas, the Scheme of teaching & examinations and other provisions are required to be regulated by an Ordinance and the Regulation,

Whereas, at the time of considering the directions issued under Section 12 (8) of the Maharashtra Public Universities Act, 2016, the Academic Council in its meeting held on 13.01.2020 vide Item No. 04 has resolved as under:

Hereinafter afresh Direction shall be issued by superseding earlier direction if the relative legislation not be made in a stipulated period,

AND

Whereas, the existing direction No. 24/ 2021 regarding examination leading to the degree of of B.E. in Artificial Intelligence & Data Science (Four Year Degree Course.... Semester Pattern) (Choice Based Credit System) in the Faculty of Science & Technology, Direction 2021 issued will be lapsed on 14.10.2021 and it will take some time to convert it into an Ordinance / Regulation. Hence, it is now imperative to issue a fresh direction,

AND

Whereas, matter of making of an Ordinance and the Regulation are a time consuming process,

Now, therefore, I, Dr. D. N. Malkhede, Vice-Chancellor of Sant Gadge Baba Amravati University, in exercise of powers conferred upon me, under sub-section (8) of Section 12 of the Maharashtra Public Universities Act, 2016, having issued the following direction;

- 1) This Direction may be called, " Examination leading to the Degree of B.E. in Artificial Intelligence & Data Science (Four Year Degree Course.... Semester Pattern) (Choice Based Credit System) in the Faculty of Science & Technology, Direction, 2021.
- 2) This Direction shall come into force with effect from the date of its issuance.
- 3) This Direction shall come into force w.e.f. the session :-
 - i) I Year B.E. (Artificial Intelligence & Data Science) Sem. I & II - 2020-2021
 - ii) II Year B.E. (Artificial Intelligence & Data Science) Sem. III & IV - 2021-2022
 - iii) III Year B.E. (Artificial Intelligence & Data Science) Sem. V & VI - 2022-2023
 - iv) IV Year B.E. (Artificial Intelligence & Data Science) Sem. VII & VIII - 2023-2024

- 4) Subject to the conditions prescribed by the Government from time to time, for admission to First Year B.E. in Artificial Intelligence & Data Science Course the candidate shall be considered eligible :

Passing 12th Standard Examination of the Maharashtra State Board of Secondary and Higher Secondary Education, with subjects :

1. English (Higher or Lower)
2. Modern Indian Language (Higher or Lower)
3. Mathematics and Statistics.
4. Chemistry.
5. Physics.
6. Any other optional subject from out of the list prescribed by the said Secondary and Higher Secondary Education Board.

OR

- i) English (Higher or lower)
- ii) Mathematics and Statistics.
- iii) Chemistry
- iv) Physics
- v) Vocational subject (Defined by the said Board as a Technical Subject)

OR

An Examination recognised by the Sant Gadge Baba Amravati University as an equivalent to the above.

- 5) Subject to the conditions prescribed by the Govt. from time to time for direct admission to second Year B.E. in Artificial Intelligence & Data Science Course, the candidates shall be considered eligible :-

Passing Diploma in relevant branch in First Division, awarded by the Board of Technical Examination of Maharashtra State, Mumbai.

OR

Any Diploma equivalent to the corresponding Diploma of the Board of Technical Examination of Maharashtra State, Mumbai.

- 6) The Scheme of teaching & examination of Semester I / II (Group A & B) and the procedure for bifurcation of the students in Group A & Group B of the Course shall be implemented from the session 2020-21 & onwards which shall be same as the Schemes of all branches of Semester I & II of B.E./B.Text.E./B.Tech.(Chem.Engg.) has been already implemented from the academic session 2020-21 and which is notified vide Direction No. 21/2020 is appended as per **Appendix 'A' & B'** with this Direction.
- 7) The Schemes of teaching & examination of Semester III to VIII of the Course B.E. in Artificial Intelligence & Data Science which shall be implemented from the session 2021-2022 & onwards as per **Appendix 'C'** appended with the Direction.
- 8) The Degree of Bachelor of Engineering shall be awarded to an examinee who in accordance with the provisions of this Direction qualifies for the award in the branch B.E. in Artificial Intelligence & Data Science .

9) (i) There shall be Eight Semester examinations leading to the Degree of B.E. in Artificial Intelligence & Data Science (First, Second, Third, Fourth, Fifth, Sixth, Seventh & Eight Semester)

(ii) The first & Second Semester Examinations shall be common for all the branches.

10) The period of Academic Session shall be such as may be notified by the University.

11) The main examination of first, third, fifth and seventh semester shall be held by the University in winter & supplementary examination in summer every year. And main examination of second, fourth, sixth & eighth semester shall be held in summer & the supplementary examination in winter every year.

12) The Internal Assessment marks for theory should be based on Class Test and Attendance as follows :-

(a) Class Test Marks will be based upon two Class Tests.	-	15
(b) Attendance	-	Mark/s
75% to 80%	-	1
81% to 85%	-	2
86% to 90%	-	3
91% to 95%	-	4
96% to 100%	-	5

Wherever if internal assessment marks are less than (10) then it should be converted out of 20.

13) Subject to his/her compliance with the provisions of this Direction & other Ordinances pertaining to Examination in force from time to time, the applicant for admission, at the end of the course of study of a particular semester/session, to an Examination specified in column (1) of the table I below, shall be eligible to appear if,

- i) he/she satisfies with the conditions in the table and the provisions thereunder.
- ii) he/she complies with the provisions of the ordinance pertaining to the Examination in general from time to time.
- iii) he/she has prosecuted a regular course of study in a college affiliated to the University.
- iv) he/she has in the opinion of the Principal shown satisfactory progress in his/her studies.

TABLE I

Name of Exam B.E. in Artificial Intelligence & Data Science	The student should have passed Exam. of	The Student should have satisfactorily completed the following semester	The student should have passed the following examination
1.	2.	3.	4.
First Semester Group A/Group B	XII standard Examination or equivalent	.....	.....
Second Semester Group A/Group B	.....	I Semester Group A/Group B	.....
Third Semester	.....	II Semester Group A/Group B	2/3rd heads of I & II Sem. combined together
Fourth Semester	.....	III Semester	.....
Fifth Semester	I & II Sem.	IV Semester	2/3rd heads of III & IV Sem. combined together
Sixth Semester	.....	V Semester	.....
Seventh Semester combined together	III & IV Sem.	VI Semester	2/3rd heads of V & VI Sem.
Eighth Semester	.....	VII Semester	.....

14) An examinee who has passed 2/3 rd heads of passing shall be allowed to keep term in the next higher class.

Explanation :

- (i) While calculating 2/3 rd heads of passing, fraction if any shall be ignored.
- (ii) For considering the heads of passing, every theory and every practical shall be considered as separate head of passing.

15) The fees for the Course B.E. in Artificial Intelligence & Data Science Examinations (Theory & Practical) shall be as prescribed by University from time to time.

16) The computation of Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) of an examinee shall be done as given below :-

The marks will be given in all examinations which will include college assessment marks and the total marks for each Theory / Practical shall be converted into Grades as per **Table II**.

SGPA shall be calculated based on Grade Points corresponding to Grade as given in Table II and the Credits allotted to respective Theory / Practical shown in the scheme for respective semester.

SGPA shall be computed for every semester and CGPA shall be computed only in VIII semester. The CGPA of VIII semester shall be calculated based on SGPA of VII and SGPA of VIII semester as per following computation :-

$$SGPA = \frac{C_1 \times G_1 + C_2 \times G_2 + \dots + C_n \times G_n}{C_1 + C_2 + \dots + C_n}$$

Where, C_1 = Credit of individual Theory / Practical
 G_1 = Corresponding Grade Point obtained in the respective Theory / Practical

$$CGPA = \frac{(SGPA)_{VII} \times (Cr)_{VII} + (SGPA)_{VIII} \times (Cr)_{VIII}}{(Cr)_{VII} + (Cr)_{VIII}}$$

Where, $(SGPA)_{VII}$ = SGPA of VII Semester
 $(Cr)_{VII}$ = Total Credits for VII Semester
 $(SGPA)_{VIII}$ = SGPA of VIII Semester
 $(Cr)_{VIII}$ = Total Credits for VIII Semester

CGPA equal to 6.00 and above shall be considered as equivalent to First Class which shall be mentioned on Grade Card of VIII Semester as a foot note.

**TABLE II
THEORY**

Grade	Percentage of Marks	Grade Points
AA	80 ÷ Marks ÷ 100	10
AB	70 ÷ Marks < 80	9
BB	60 ÷ Marks < 70	8
BC	55 ÷ Marks < 60	7
CC	50 ÷ Marks < 55	6
CD	45 ÷ Marks < 50	5
DD	40 ÷ Marks < 45	4
FF	00 ÷ Marks < 40	0
ZZ	Absent in Examination	0

PRACTICAL

Grade	Percentage of Marks	Grade Points
AA	85 ÷ Marks ÷ 100	10
AB	80 ÷ Marks < 85	9
BB	75 ÷ Marks < 80	8
BC	70 ÷ Marks < 75	7
CC	65 ÷ Marks < 70	6
CD	60 ÷ Marks < 65	5
DD	50 ÷ Marks < 60	4
FF	00 ÷ Marks < 50	0
ZZ	Absent in Examination	0

- 17) (i) The scope of the subjects shall be as indicated in the syllabi.
(ii) The medium of instruction and examination shall be English.

18) The Guidelines of the A.I.C.T.E. New Delhi and D.T.E., Govt. of Maharashtra, Mumbai shall be applicable from time to time after having noted / approved by the Competent Authority.

19) As per A.I.C.T.E. Model Curriculum, an Induction Programme of three (3) weeks duration is mandatory to the students at the start of the first semester.

- 20) (i) The Workload and the Credits of Semester I to VIII shall be as per the Scheme of teaching & examination of the Course appended with this Direction.
- (ii) The workload for the subject Environment Studies for Semester III & IV (3ES06 & 4ES06) which is common for all branches of Engineering & Technology (Excluding Architecture) in the Faculty of Science & Technology shall be as per Direction No. 20/2021 dtd. 01/04/2021 and the Syllabus of the subject Environmental Studies shall be as per Notification No. 33/2021 dtd. 01/04/2021.
- (iii) Open Electives (OE): Open Elective to be opted from the courses offered by other disciplines of Engineering & Technology of the university / Massive Open learning Courses (MOOC) such as SWAYAM pertaining to the profession.
- (iv) Students completing foreign language course or completing minimum 4 weeks internship (Full time in Vacations) or participating in sports at National / International level shall be exempted from O.E. in the same / adjacent semester.
- (v) An Orientation Program of 15 hours duration /MOOC to be offered to the students during (a) Vth Semester : Indian Constitution (b) VIth Semester: Indian Traditional Knowledge.
- 21) The Provisions of Ordinance No. 18 of 2001 in respect of an Ordinance to provide grace marks for passing in a Head of passing and improvement of division (Higher Class) and getting distinction in the subject and condonation of deficiency of marks in a subject in all the Faculties prescribed by the Direction No. 15 of 2017 shall be applicable to each examination under this Direction.
- 22) An examinee who does not pass; or who fails to present himself/herself for the examination shall be eligible for readmission to the same examination/semester, on payment of fresh fees and such other fees as may be prescribed from time to time.
- 23) A candidate who could not complete a semester satisfactorily or who has failed will be eligible for readmission to the same semester.
However, readmission to semester should be allowed only when a regular session is running for the particular semester.
- 24) One who has passed the Final B.E. in Artificial Intelligence & Data Science examination of the University and who desires to take B.E./B.Text.E./B.Tech.(Chem. Engg.)/ B.Tech. (Chem.) Degree in another branch, shall be admitted to the third Semester of that branch and shall be governed by this Direction for all other purposes.
- 25) After examinations the Board of Examination & Evaluation shall publish the result of the examinees as early as possible and the branchwise merit list shall be notified as per Ordinance No.6.
- 26) Notwithstanding any thing to the contrary in this Direction, no one shall be admitted to any examination under this Direction, if he/she has already passed the said examinations or an equivalent examinations of any statutory University.
- 27) (i) The examinees who have passed in all the subjects of the branch B.E. in Artificial Intelligence & Data Science shall be eligible for award of the Degree of Bachelor of Engineering B.E. in Artificial Intelligence & Data Science.
- (ii) The Degree certificate in the prescribed form, shall be signed by the Vice-Chancellor.

Date : 13/10/2021

Sd/-
(Dr. D. N. Malkhede)
Vice-Chancellor

Four Year Degree Course in Bachelor of Engineering Branch : B.E./B.Tech./B.Text. E.(Common to all the Branches)
Semester Pattern (Choice Based Credit system)

Semester :FIRST/ SECOND GROUP A																		
Sr. No.	Subject Code	TEACHING SCHEME						EXAMINATION SCHEME										
		Subject		HOURS / WEEK			Total HOURS/WEEK	CREDITS	THEORY					PRACTICAL				
				Lecture	Tutorial	P/D			DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESSMENT	TOTAL	MIN. PASSING MARKS	MAX. MARKS		TOTAL	MIN. PASSING MARKS	
												EXTERNAL	INTERNAL					
THEORY																		
01	1 A 1	Engineering Mathematics I		3	1	-	4	4	3	80	20	100	40	-	-	-	-	
02	1 A 2	Engineering Physics		4	-	-	4	4	3	80	20	100	40	-	-	-	-	
03	1 A 3	Engineering Mechanics		3	1	-	4	4	3	80	20	100	40	-	-	-	-	
04	1 A 4	Computer Programming		3	-	-	3	3	3	80	20	100	40	-	-	-	-	
PRACTICALS																		
05	1 A 5	Workshop Practice		-	-	4	4	2	-	-	-	-	-	25	25	50	25	
06	1 A 6	Engineering Physics Laboratory		-	-	2	2	1	-	-	-	-	-	25	25	50	25	
07	1 A 7	Engineering Mechanics Laboratory		-	-	2	2	1	-	-	-	-	-	25	25	50	25	
08	1 A 8	Computer Programming Laboratory		-	-	2	2	1	-	-	-	-	-	25	25	50	25	
		TOTAL		13	2	10	25	20				400				200		
Note- An Induction Program of Three Weeks duration to be offered to the students at the start of First Year.														TOTAL		600		
Semester :FIRST/ SECOND GROUP B																		
THEORY																		
01	1 B 1	Engineering Mathematics II		3	1	-	4	4	3	80	20	100	40	-	-	-	-	
02	1 B 2	Engineering Chemistry		4	-	-	4	4	3	80	20	100	40	-	-	-	-	
03	1 B 3	Basic Electrical Engineering		3	1	-	4	4	3	80	20	100	40	-	-	-	-	
04	1 B 4	Engineering Graphics		3	-	-	3	3	3	80	20	100	40	-	-	-	-	
PRACTICALS																		
05	1 B 5	English Communication Skills Laboratory	-	-	4	4	2		-	-	-	-	-	25	25	50	25	
06	1 B 6	Engineering Chemistry Laboratory		-	-	2	2	1	-	-	-	-	-	25	25	50	25	
07	1 B 7	Basic Electrical Engineering Laboratory		-	-	2	2	1	-	-	-	-	-	25	25	50	25	
08	1 B 8	Engineering Graphics Laboratory		-	-	2	2	1	-	-	-	-	-	25	25	50	25	
		TOTAL		13	2	10	25	20				400				200		
Note- An Induction Program of Three Weeks duration to be offered to the students at the start of First Year.														TOTAL		600		

Note- An Induction Program of Three Weeks duration to be offered to the students at the start of First Year.

The procedure for bifurcation of the students in Group – A and Group-B of First Year Scheme for B.E. / B.Text.E. / B.Tech. (Chem. Engg.)/ B.Tech. (Chem. Tech.) Polymer (Plastic) Tech.

- 1) The sanctioned intake and / or the number of candidates admitted to first year Engineering shall be divided into two groups as A and B in multiples of 60 preferably at the institute level.
- 2) Group-A candidates shall register for Group-A subjects in first semester and Group-B candidates shall register for Group-B subjects in first semester.
- 3) The candidates shall be examined for their subjects from the respective groups in first semester.
- 4) In the Second semester, candidates from Group-B shall register for subject of Group-A. Similarly, candidates from Group-A shall register for subjects of Group-B.
- 5) The candidates shall be examined for their subjects from the other groups in second semester.
- 6) Thus, at the end of the first year, all the subjects shall be studied by the candidates from both the groups.
- 7) The mark list shall show only the group obtained in respective Semester, like First Semester Group- B, First Semester Group-A.
- 8) The exercise on the part of the college shall be to ensure that the candidates fill up the examination forms correctly according to the subjects group they have registered in both the semesters.

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH : ARTIFICIAL INTELLIGENCE & DATA SCIENCE-SEMESTER PATTERN (CHOICE BASED CREDIT GRADE SYSTEM)
SEMESTER : THIRD

Teaching Scheme							Examination scheme									
Sr.No.	Subject Code	Subject Name	Hours Per Week			Total Hours / Week	Credit	Theory					Practical			
			Lecture	Tutorial	P/D			Duration of Paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	Max Marks		Total	Min Passing Marks
						External	Internal									
Theory																
1	3ADO1	Mathematics for Data Science	3	1		4	4	3	80	20	100	40				
2	3ADO2	Discrete Structure	3			3	3	3	80	20	100	40				
3	3ADO3	Programming Methodology Using Python	3			3	3	3	80	20	100	40				
4	3ADO4	Data Structures	3			3	3	3	80	20	100	40				
5	3ADO5	Analog & Digital Electronics	3			3	3	3	80	20	100	40				
6	4ESO6	Environmental Studies *	2			2	0									
Practicals																
7	3ADO6	Programming Methodology (Python) Lab			2	2	1						25	25	50	25
8	3ADO7	Data Structures Lab			2	2	1						25	25	50	25
9	3ADO8	Analog & Digital Electronics Lab			2	2	1						25	25	50	25
10	3ADO9	C Skill-Lab (#)			2	2	1						25	25	50	25
		Total	17	1	8	26	20				500				200	
														Total	700	

* As per the direction / Ordinance of the University

C Skill Lab I- based on technology like – **PHP, Web Technology etc.** to be decided by individual Dept. of respective College

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH : ARTIFICIAL INTELLIGENCE & DATA SCIENCE-SEMESTER PATTERN (CHOICE BASED CREDIT GRADE SYSTEM)
SEMESTER : FOURTH

Teaching Scheme								Examination scheme								
Sr.No.	Subject Code	Subject Name	Hours Per Week			Total Hours / Week	Credit	Theory					Practical			
			Lecture	Tutorial	P/D			Duration of Paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	Max Marks		Total	Min Passing Marks
						External	Internal									
Theory																
1	4ADO1	Artificial Intelligence	3			3	3	3	80	20	100	40				
2	4ADO2	Statistical Methods	3			3	3	3	80	20	100	40				
3	4ADO3	Computer Architecture & Operating System	3			3	3	3	80	20	100	40				
4	4ADO4	Microcontroller, Sensors & Actuators	3			3	3	3	80	20	100	40				
5	4ADO5	Theory of Computation	3	1		4	4	3	80	20	100	40				
6	4ESO6	Environmental Studies*	2			2	2	3	80	20	100	40				
Practicals																
7	4ADO6	Artificial Intelligence Lab			2	2	1						25	25	50	25
8	4ADO7	Operating System Lab			2	2	1						25	25	50	25
9	4ADO8	Microcontroller, Sensors & Actuators Lab			2	2	1						25	25	50	25
10	4ADO9	C Skill-Lab II (#)			2	2	1						25	25	50	25
		Total	17	1	8	26	22				600				200	
														Total	800	

* As per the direction / Ordinance of the University

C Skill Lab II- based on technology like – **Raspberry PI/Ardino etc.** to be decided by individual Dept. of respective College

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI

FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING

BRANCH : ARTIFICIAL INTELLIGENCE & DATA SCIENCE-SEMESTER PATTERN (CHOICE BASED CREDIT GRADE SYSTEM)

SEMESTER : FIFTH

Teaching Scheme								Examination scheme								
Sr.No.	Subject Code	Subject Name	Hours Per Week			Total Hours / Week	Credit	Theory					Practical			
			Lecture	Tutorial	P/D			Duration of Paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	Max Marks		Total	Min Passing Marks
													External	Internal		
Theory																
1	5ADO1	Data Science	4			4	4	3	80	20	100	40				
2	5ADO2	Machine Learning Techniques	3			3	3	3	80	20	100	40				
3	5ADO3	Computer Networks	3			3	3	3	80	20	100	40				
4	5ADO4	Professional Elective - I (#)	3			3	3	3	80	20	100	40				
5	5ADO5	Open Elective-I (\$)	3			3	3	3	80	20	100	40				
Practicals																
6	5ADO6	Machine Learning Techniques Lab			2	2	1						25	25	50	25
7	5ADO7	Computer Network Lab			2	2	1						25	25	50	25
8	5ADO8	Professional Elective - I Lab			2	2	1						25	25	50	25
9	5ADO9	C Skill-Lab III (*)			2	2	1						25	25	50	25
		Total	16	0	8	24	20				500				200	
														Total	700	
		Professional Elective-I (#)														
		Internet of Things														
		Cyber Security														
		Cloud Computing														
		Open Elective – I (\$)														
		Data Structure and Algorithm														
		Database Management Systems														
		Software Testing and Quality Assurance														

* C Skill Lab III- based on technology like **Angular & React, Exprs, Node. js etc.** to be decided by individual Dept. of respective College

An Orientation Program of 15 hours duration / MOOC on Indian Constitution to be offered to the students during the Vth Semester

Open Elective I to be opted from the courses offered by other engineering technology boards of the university / Massive Open learning courses (MOOC) such as SWAYAM pertaining to the profession

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI

FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING

BRANCH : ARTIFICIAL INTELLIGENCE & DATA SCIENCE-SEMESTER PATTERN (CHOICE BASED CREDIT GRADE SYSTEM)

SEMESTER : SIXTH

Teaching Scheme							Examination scheme									
Sr.No.	Subject Code	Subject Name	Hours Per Week			Total Hours / Week	Credit	Theory					Practical			
			Lecture	Tutorial	P/D			Duration of Paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	Max Marks		Total	Min Passing Marks
External	Internal															
Theory																
1	6ADO1	Data Analytics	3			3	3	3	80	20	100	40				
2	6ADO2	Artificial Neural Network & Fuzzy Logic	4			4	4	3	80	20	100	40				
3	6ADO3	Database Management System for Data Science	3			3	3	3	80	20	100	40				
4	6ADO4	Professional Elective – II (#)	3			3	3	3	80	20	100	40				
5	6ADO5	Open Elective-II	3			3	3	3	80	20	100	40				
Practicals																
6	6ADO6	Data Analytics Lab			2	2	1						25	25	50	25
7	6ADO7	Database Management System for Data Science Lab			2	2	1						25	25	50	25
8	6ADO8	Professional Elective – II Lab			2	2	1						25	25	50	25
9	6ADO9	C Skill-Lab IV (*)			2	2	1						25	25	50	25
		Total	16		8	24	20				500				200	
														Total	700	
		Professional Elective-II (#)														
		Data Warehousing														
		Cryptography														
		Robotics														
		Open Elective – II (\$)														
		Software Project Management														
		E-Commerce														
		Introduction to Data Science														

* C Skill Lab IV- based on technology like DevOp to be decided by individual Dept. of respective College

An Orientation Program of 15 hours duration / MOOC on Indian Traditional Knowledge to be offered to the students during the VIth Semester

Open Elective II to be opted from the courses offered by other engineering technology boards of the university / Massive Open learning courses (MOOC) such as SWAYAM pertaining to the profession.

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI

FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING

BRANCH : ARTIFICIAL INTELLIGENCE & DATA SCIENCE-SEMESTER PATTERN (CHOICE BASED CREDIT GRADE SYSTEM)

SEMESTER : SEVENTH

Teaching Scheme							Examination scheme									
Sr.No.	Subject Code	Subject Name	Hours Per Week			Total Hours / Week	Credit	Theory					Practical			
			Lecture	Tutorial	P/D			Duration of Paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	Max Marks		Total	Min Passing Marks
						External	Internal									
Theory																
1	7ADO1	Social Science & Engineering Economics	3			3	3	3	80	20	100	40				
2	7ADO2	Deep Learning	3			3	3	3	80	20	100	40				
3	7ADO3	Big Data Analytics & Hadoop	4			4	4	3	80	20	100	40				
4	7ADO4	Blockchain With AI	3			3	3	3	80	20	100	40				
5	7ADO5	Professional Elective – III	3			3	3	3	80	20	100	40				
Practicals																
6	7ADO6	Deep Learning Lab			2	2	1						25	25	50	25
7	7ADO7	Big Data Analytics & Hadoop Lab			2	2	1						25	25	50	25
8	7ADO8	Blockchain With AI Lab			2	2	1						25	25	50	25
9	7ADO9	Project & Seminar			8	8	4							50	50	25
		Total	16		14	30	23				500				200	
														Total	700	
		Professional Elective-III														
		Natural Language Processing														
		Data Mining														
		Embedded Systems														

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI

FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING

BRANCH : ARTIFICIAL INTELLIGENCE & DATA SCIENCE-SEMESTER PATTERN (CHOICE BASED CREDIT GRADE SYSTEM)

SEMESTER : EIGHTH

Teaching Scheme							Examination scheme									
Sr.No.	Subject Code	Subject Name	Hours Per Week			Total Hours / Week	Credit	Theory					Practical			
			Lecture	Tutorial	P/D			Duration of Paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	Max Marks		Total	Min Passing Marks
						External	Internal									
Theory																
1	8ADO1	Data Modeling & Visualization	3			3	3	3	80	20	100	40				
2	8ADO2	Ethics in Data Science	3			3	3	3	80	20	100	40				
3	8ADO3	Cognitive Technology	3			3	3	3	80	20	100	40				
4	8ADO4	Professional Elective – IV	3			3	3	3	80	20	100	40				
Practicals																
5	8ADO5	Data Modeling & Visualization Lab			2	2	1						25	25	50	25
6	8ADO6	Cognitive Technology Lab			2	2	1						25	25	50	25
7	8ADO7	Project & Seminar			12	12	6						75	75	150	75
		Total	12		16	28	20				400				250	
														Total	650	
		Professional Elective-IV														
		Virtual & Augmented Reality														
		Wireless Sensor Networks														
		Predictive Analytics														