ANNEXURE

5th Meeting of the Academic Council on 17th August, 2022



ANURAG UNIVERSITY

Ghatkesar (M), Medchal-Malkajgiri (Dist.), Hyderabad, Telangana 500088

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INDEX

Item No.	ltem	Page No.
1	Confirmation of the Minutes of the 4 th meeting of the Academic Council held on 31.05.2022	3
2	Action taken on the decisions taken in the 4 th meeting of the Academic Council	11
3	Ratification of the Academic Calendars for the AY 2022-23	17
4	Approval of the Academic Regulations (R21) of the B. Sc. (Hons.) Agriculture Sciences	29
5	Approval of the course structure of the 2 nd , 3 rd and 4 th years and syllabi of the 2 nd year B. Sc. (Hons.) Agriculture Sciences	45
6	Approval of the Academic Regulations of the MCA program	115
7	Approval of the course structure of the 1st year MCA program	139
8	Approval of the amendment to the 1 st year B. Tech course structure and 2 nd year mandatory courses to balance the teaching load	149
9	Approval to reorganize the syllabus for the 3 rd Year B. Tech course entitled Essentials of Machine Learning	162
10	Approval of the syllabus of Research Paper Writing and Publication Ethics (RPW&PE) course of Pre-Ph.D.	167
11	Amendment of the Ph. D. Regulations (section 5.1) with reference to the eligibility criteria for admission into the Ph. D. program for MCA & M. Sc. (Computer Science) graduates	171
12	Approval of the amendments of MBA Regulations (R22)	173
13	Any other item with the permission of the chair	178



Item 1:

Confirmation of the Minutes of the 4th meeting of the Academic Council held on 31.05.2022



MINUTES OF THE FOURTH MEETING OF THE ACADEMIC COUNCIL HELD ON $31^{\rm ST}$ MAY, 2022 AT 11.00 AM

Members Present / Absent

Dr. S Ramachandram, Vice Chancellor	S. No	Name of the Member	Designation	Present/
Vice Chancellor Dr. Balaji Utla, Dean, School of Management & Chairperson, BoS, Business Management Dr. V Vijaya Kumar, Dean, R& D and Chairperson, BoS, CSE Dr. G Vishnu Murthy, Dean, School of Engineering Dr. M Mutha Reddy, Dean, Examinations Dr. KS Reddy, Dean, Academic & Planning & Head, Department of IT & Chairperson, BoS, IT Dr. Narayana Reddy, Dean, School of Agricultural Sciences Dr. Vasudha Bakshi, Dean, School of Pharmacy & Chairperson, BoS, Pharmacy Dr. M Venkata Ramana, Director, IQAC Dr. S Madhu, Head, Department of Mechanical Engineering Dr. T Krishnaiah, Chairperson, BoS, Mechanical Engineering Dr. S Sathees Kumaran, Head, Department of ECE & Chairperson, BoS, ECE Dr. M Auli Kumar, Head, Department of EEE Dr. M Ruknda Vani, Head, Department of Chemical Engineering & Chairperson, BoS, EEE Dr. M Mukunda Vani, Head, Department of Chemical Engineering & Chairperson, BoS Chemical Engineering & Chairperson, BoS, EEE Dr. M Mukunda Vani, Head, Department of Chemical Engineering & Chairperson, BoS Chemical Engineering				Absent
Dr. Balaji Utla, Dean, School of Management & Chairperson, BoS, Business Management Present	1	,	Chairperson	Present
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Chairperson, BoS Chemical Engineering 16 Dr. K Ramachandra Reddy, Member Present		, and the second		
16 Dr. K Ramachandra Reddy, Member Present				
	16		Member	Present
		Chairperson, BoS, Civil Engineering		11000111



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17	Dr. B Narender,	Member	Present
	Head, Department of Civil Engineering		
18	Dr. Vishnu Vandana,	Member	Present
	Head, Department of Business Management		
19	Dr. G.V.S. Ananta Lakshmi,	Member	Present
17	Head, Department of English &	Wichioor	Tresent
	Chairperson, BoS, English		
20	Dr. V Srinivasa Rao,	Member	Present
20	Dean, Student Affairs,	Wichioci	1 Tesent
	Chairperson, BoS, Mathematics	M1	D
21	Dr. K Shiva Reddy,	Member	Present
	Head, Department of Mathematics		
22	Dr. Savita Belwal,	Member	Present
	Head, Department of Chemistry &		
	Chairperson, BoS Chemistry		
23	Dr. M Srinivas Reddy,	Member	Present
	Head, Department of Physics &		
	Chairperson, BoS Physics		
Govern	ing Body Nominees		
24	Dr. Shanta Thoutam,	Member	Present
	Chief Innovation Officer,		
	Govt of Telangana		
25	Prof. E Sai Baba Reddy,	Member	Present
	Former Rector &		
	Prof, Dept. of Civil Engineering,		
	Jawaharlal Nehru Technological University,		
	Hyderabad		
26	Prof. BN Bhandari,	Member	Present
20	Professor Dept. of ECE,	Wichioci	Tresent
	Jawaharlal Nehru Technological University,		
	Hyderabad		
27	Dr. B Satyanarayana Reddy,	Member	Absent
21	MD, Nosch Labs, Hyderabad	Member	Ausent
C41			
	K Nominees Shri. Yeluri Kushal Vidya Mohanji,	Member	A 1
28	I NOTE Y PHILL KIICHAL V 10VA MONANII	i wiember	Absent
		TVICINIOCI	
	CSE III Year		A1 .
29	CSE III Year Ms. B Sravanthi,	Member	Absent
29	CSE III Year Ms. B Sravanthi, ECE III year		Absent
29 Sponso	CSE III Year Ms. B Sravanthi, ECE III year ring Body Nominees	Member	
29	CSE III Year Ms. B Sravanthi, ECE III year ring Body Nominees Dr. P Rajeshwar Reddy,		Absent
29 Sponso 30	CSE III Year Ms. B Sravanthi, ECE III year ring Body Nominees Dr. P Rajeshwar Reddy, Chairman, GECT	Member Member	Absent
29 Sponso	CSE III Year Ms. B Sravanthi, ECE III year ring Body Nominees Dr. P Rajeshwar Reddy, Chairman, GECT Mrs. S Neelima,	Member	
29 Sponso 30 31	CSE III Year Ms. B Sravanthi, ECE III year ring Body Nominees Dr. P Rajeshwar Reddy, Chairman, GECT Mrs. S Neelima, Managing Trustee, GECT	Member Member	Absent
29 Sponso 30	CSE III Year Ms. B Sravanthi, ECE III year ring Body Nominees Dr. P Rajeshwar Reddy, Chairman, GECT Mrs. S Neelima,	Member Member	Absent

			ANURAG
33	Dr. M Srinivasa Rao,	Member	Present
	Associate Professor, English, AGI		
Vice - (Chancellor Nominees		
34	Dr. M Sikindar Baba,	Member	Present
	Controller of Examination &		
	Associate Professor, Department of Mechanical		
	Engineering		
35	Dr. Lakshmi Ramana,	Member	Present
	Professor, Department of English		
Registr	ar		
36	Dr. S Sameen Fatima,	Member	Present
	Registrar &	Secretary/	
	Head, Dept of AI and Chairperson, BoS, AI	Member	
Invited	Members		
37	Dr. UB Desai, Chancellor, Anurag University	Invitee	Present
38	Dr. K Mamatha	Invitee	Present
	Training & Placement Officer &		
	Associate Professor, Department of Business		

On behalf of Anurag University, the Vice-Chancellor welcomed all the members of the Academic Council and invitees to the fourth meeting of the Academic Council. After detailed deliberations, the following decisions were taken:

Item 1: Confirmation of the minutes of the 3rd meeting of the Academic Council held on 03.07.2021

Resolution 1: It was resolved to confirm the minutes of the 3rd meeting of the Academic Council held on 03.07.2021.

Item 2: Action taken on the decisions taken in the 3rd meeting of the Academic Council **Resolution** 2: The Council noted the details of the action taken on the decisions of the 3rd meeting of the Academic Council, presented by the Vice-Chancellor. It was suggested that the BSc in Data Science & BSc in AI may be renamed as BS in Data Science & BS in AI.

Item 3: Presentation of the Academic Regulations of the B. Tech - Hons. / Minor (R21) Program **Resolution 3:** It was resolved to approve the Academic Regulations of the B. Tech - Hons. / Minor (R21) Program. It was suggested that the CGPA requirement be retained at 7.5 for now and reviewed after two years. The design of the degree certificate with Honors & Minors option needs to be firmed up.

Item 4: Presentation of the Academic Regulations of the M. Tech (R21) Program **Resolution 4:** It was resolved to approve the Academic Regulations of the M. Tech (R21) Program.

Management



Item 5: Presentation of the minutes of the Board of Studies (BoS) in School of Engineering including course structure and syllabi for the programs proposed to be offered from the Academic Year 2022-23, for discussion and approval.

Resolution 5: The following resolutions were made department-wise:

1. Department of Artificial Intelligence (AI)

Resolution 5 (1): Resolved to approve the minutes of the Board of Studies including the following:

- 1. BTech (AI) Course Structure for III and IV Year (I and II Semester) and the syllabi for the III Year (I and II Semester)
- 2. BTech (AIML) Course Structure for III and IV Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

2. Department of Chemical Engineering

Resolution 5 (2): Resolved to approve the minutes of the Board of Studies including the following:

1. BTech (Chemical Engineering) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

3. Department of Civil Engineering

Resolution 5 (3): Resolved to approve the minutes of the Board of Studies including the following:

1. BTech (Civil Engineering) Course Structure for III and IV Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

4. Department of Computer Science & Engineering (CSE)

Resolution 5 (4): Resolved to approve the minutes of the Board of Studies including the following:

- 1. BTech (CSE) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)
- 2. BTech (CSE-Data Science) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

5. Department of Electrical & Electronics Engineering (EEE)

Resolution 5 (5): Resolved to approve the minutes of the Board of Studies including the following:

1. BTech (EEE) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)



6. Department of Electronics & Communication Engineering (ECE)

Resolution 5 (6): Resolved to approve the minutes of the Board of Studies including the following:

1. BTech (ECE) Course Structure for III and IV Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

7. Department of Information Technology (IT)

Resolution 5 (7): Resolved to approve the minutes of the Board of Studies including the following:

- 1. BTech (IT) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)
- 2. BTech (Cyber Security) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

8. Department of Mechanical Engineering

Resolution 5 (8): Resolved to approve the minutes of the Board of Studies including the following:

1. BTech (Mechanical Engineering) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

Item 6.1: Amendments in B. Tech courses for discussion and approval.

Resolution 6.1: For the courses having Design/Drawing (such as Engineering Graphics, Engineering Drawing, Machine Drawing), it is resolved to revise the evaluation as follows: For Mechanical Engineering, Civil Engineering and Chemical Engineering:

- CIE: 40 marks (Day to day activities: 20 marks, Mid Term: 20 marks)
- SEE: 60 marks as theory course.

For other than Mechanical Engineering, Civil Engineering and Chemical Engineering branches:

- CIE: 50 marks (Day to day activities: 30 marks, Internal examination: 20 marks)
- SEE: 50 marks.

Resolution 6.2: Resolved to change the name of the course entitled "Java Programming" of B. Tech in Electronics and Communication Engineering (R20) to "Object Oriented Programming through Java".



Item 7: Presentation of the minutes of the Board of Studies (BoS) in School of Pharmacy, including course structure and syllabi for the programs proposed to be offered from the Academic Year 2022-23, for discussion and approval.

Resolution 7: Resolved to approve the minutes of the Board of Studies including the following:

1. B. Pharmacy Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

Item 8: Presentation of the minutes of the Board of Studies (BoS) in School of Management, including course structure and syllabi for the programs proposed to be offered from the Academic Year 2022-23, Regulations of MBA program (R22) and proposed trimester system for discussion and approval.

Resolution 8: Resolved to approve the minutes of the Board of Studies including the following:

- 1. Offer MBA program in trimester system instead of semester system
- 2. Offer MBA in Business Analytics, MMS in Data Sciences and MBA Vernacular
- 3. PG Diploma & Certification courses
- 4. BBA (Business Analytics) Course Structure for II and III Year (I and II Semester) and the syllabi for the II and III Year (I and II Semester)
- 5. BBA (Digital Marketing) Course Structure for II and III Year (I and II Semester) and the syllabi for the II and III Year (I and II Semester)
- 6. BBA (FinTech) Course Structure for II and III Year (I and II Semester) and the syllabi for the II and III Year (I and II Semester)
- 7. BBA (Supply Chain Management) Course Structure for II and III Year (I and II Semester) and the syllabi for the II and III Year (I and II Semester)
- 8. MBA Course Structure for I and II Year and Syllabi for I Year (I, II, III Trimester)
- 9. MBA (Business Analytics) Course Structure for I and II Year and Syllabi for I Year (I, II, III Trimester)
- 10. MBA Academic Regulations (AU-R22), on the condition that the evaluation pattern be changed to 60:40 for Continuous Internal Evaluation and Term End Examinations. Further, the Continuous Internal Evaluation Component "Attendance" be replaced with "Class Participation" with a weightage of 15 marks instead of 5 marks.
- 11. Structure & syllabus of BTech Minors Specialisations in Management: syllabi for 7 courses

Item 9: Presentation of the Amendments to the Ph. D. Rules & Regulations for discussion and approval.

Resolution 9.1A: Resolved to rename the existing compulsory pre-registration RPWP course as "Research Paper Writing and Publication Ethics (RPW&PE)" course with four credits and 100 marks.

Resolution 9.1B: Resolved to amend the pattern of examination of RPW&PE coursework: The research scholar shall secure a minimum of 50% marks to pass this course. The Scholar needs to



present two seminars on the approved research papers and research publication ethics before DRC. Each seminar is evaluated for 100 marks (30 marks for technical writing of the seminar content and 40 marks for technical presentation, and 30 marks for Research Publication Ethics). The DRC will evaluate the Scholar based on the average marks of two seminar presentations.

Resolution 9.2: Resolved to exempt M.Phil. Degree holders of regular mode in the concerned subject from AU Ph.D. eligibility test and from the Ph.D. course work (however, the scholars need to appear and pass the Research Paper Writing and Publication Ethics (RPW&PE) course).

Item 10: Proposal for the 5-day classwork for students

Resolution 10: The proposal for the 5-day classwork for students was discussed by all the participants, including the Chairman, and it was resolved to defer the matter.

Item 11: Any other matter with the permission of the Chair

Resolution 11: Resolved to defer the matter of new programs to be introduced in the next academic year to the next Academic Council meeting, as further deliberations are required.

The Chancellor suggested the following:

- a. Courses on speech processing, speech recognition may be included in BTech (AI) / BTech (AIML) programs in the IV Year.
- b. Courses on sustainability, sustainable materials may be included in the programs offered by the Civil Engineering and Chemical Engineering departments.
- c. A course on EV & Hybrid Vehicles be offered as Core Courses in the BTech (EEE) program. Further, a course on Hydrogen Vehicles may be included in the program.
- d. A course on mobile communications be offered only as Core Course in BTech (ECE) program and 5G course may be offered as an Elective Course.
- e. A course that includes topics on homomorphic encryption may be included in the BTech (Cyber Security) program.
- f. A course on Robotics be given focus in the BTech (Mechanical Engineering) program to enhance employability of the graduates.

The meeting ended with a vote of thanks by the Registrar.



Item 2:

Action taken on the decisions taken in the 4th meeting of the Academic Council



Resolution 1: It was resolved to confirm the minutes of the 3rd meeting of the Academic Council held on 03.07.2021.

Action Taken: No action required.

Resolution 2: The Council noted the details of the action taken on the decisions of the 3rd meeting of the Academic Council, presented by the Vice-Chancellor. It was suggested that the BSc in Data Science & BSc in AI may be renamed as BS in Data Science & BS in AI so as to improve marketability.

Action Taken: The same will be adopted as and when program commences.

Resolution 3: It was resolved to approve the Academic Regulations of the B. Tech - Hons. / Minor (R21) Program. It was suggested that the CGPA requirement be retained at 7.5 for now and reviewed after two years. The design of the degree certificate with Honors & Minors option needs to be firmed up.

Action Taken: The same has been adopted into practice.

Resolution 4: It was resolved to approve the Academic Regulations of the M. Tech (R21) Program.

Action Taken: The same has been adopted into practice.

Resolution 5: The following resolutions were made department-wise:

1. Department of Artificial Intelligence (AI)

Resolution 5 (1): Resolved to approve the minutes of the Board of Studies including the following:

- i. BTech (AI) Course Structure for III and IV Year (I and II Semester) and the syllabi for the III Year (I and II Semester)
- ii. BTech (AIML) Course Structure for III and IV Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

2. Department of Chemical Engineering

Resolution 5 (2): Resolved to approve the minutes of the Board of Studies including the following:

i. BTech (Chemical Engineering) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)



3. Department of Civil Engineering

Resolution 5 (3): Resolved to approve the minutes of the Board of Studies including the following:

i. BTech (Civil Engineering) Course Structure for III and IV Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

4. Department of Computer Science & Engineering (CSE)

Resolution 5 (4): Resolved to approve the minutes of the Board of Studies including the following:

- i. BTech (CSE) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)
- ii. BTech (CSE-Data Science) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

5. Department of Electrical & Electronics Engineering (EEE)

Resolution 5 (5): Resolved to approve the minutes of the Board of Studies including the following:

i. BTech (EEE) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

6. Department of Electronics & Communication Engineering (ECE)

Resolution 5 (6): Resolved to approve the minutes of the Board of Studies including the following:

i. BTech (ECE) Course Structure for III and IV Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

7. Department of Information Technology (IT)

Resolution 5 (7): Resolved to approve the minutes of the Board of Studies including the following:

- i. BTech (IT) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)
- ii. BTech (Cyber Security) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

8. Department of Mechanical Engineering

Resolution 5 (8): Resolved to approve the minutes of the Board of Studies including the following:

i. BTech (Mechanical Engineering) Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)



Action Taken: The syllabus was approved for the items 1 to 8.

Item 6.1: Amendments in B. Tech courses for discussion and approval.

Resolution 6.1: For the courses having Design/Drawing (such as Engineering Graphics, Engineering Drawing, Machine Drawing), it is resolved to revise the evaluation as follows: For Mechanical Engineering, Civil Engineering and Chemical Engineering:

- CIE: 40 marks (Day to day activities: 20 marks, Mid Term: 20 marks)
- SEE: 60 marks as theory course.

For other than Mechanical Engineering, Civil Engineering and Chemical Engineering branches:

- CIE: 50 marks (Day to day activities: 30 marks, Internal examination: 20 marks)
- SEE: 50 marks.

Resolution 6.2: Resolved to change the name of the course entitled "Java Programming" of B. Tech in Electronics and Communication Engineering (R20) to "Object Oriented Programming through Java".

Action Taken: The amendment has been adopted.

Resolution 7: Resolved to approve the minutes of the Board of Studies including the following:

i. B. Pharmacy Course Structure for III Year (I and II Semester) and the syllabi for the III Year (I and II Semester)

Action Taken: The syllabus was approved.

Resolution 8: Resolved to approve the minutes of the Board of Studies including the following:

- i. Offer MBA program in trimester system instead of semester system
- ii. Offer MBA in Business Analytics, MMS in Data Sciences and MBA Vernacular
- iii. PG Diploma & Certification courses
- iv. BBA (Business Analytics) Course Structure for II and III Year (I and II Semester) and the syllabi for the II and III Year (I and II Semester)
- v. BBA (Digital Marketing) Course Structure for II and III Year (I and II Semester) and the syllabi for the II and III Year (I and II Semester)
- vi. BBA (FinTech) Course Structure for II and III Year (I and II Semester) and the syllabi for the II and III Year (I and II Semester)
- vii. BBA (Supply Chain Management) Course Structure for II and III Year (I and II Semester) and the syllabi for the II and III Year (I and II Semester)
- viii. MBA Course Structure for I and II Year and Syllabi for I Year (I, II, III Trimester)
- ix. MBA (Business Analytics) Course Structure for I and II Year and Syllabi for I Year (I, II, III Trimester)



x. MBA Academic Regulations (AU-R22), on the condition that the evaluation pattern be changed to 60:40 for Continuous Internal Evaluation and Term End Examinations. Further, the Continuous Internal Evaluation Component "Attendance" be replaced with "Class Participation" with a weightage of 15 marks instead of 5 marks.

Action Taken: The academic regulations are approved.

xi. Structure & syllabus of BTech Minors specializations in Management: syllabi for 7 courses

Action Taken:

- a. The items i to iii have been adopted into practice.
- b. The structure & syllabus was approved for items iv to ix and xi.

Resolution 9.1A: Resolved to rename the existing compulsory pre-registration RPWP course as "Research Paper Writing and Publication Ethics (RPW&PE)" course with four credits and 100 marks.

Resolution 9.1B: Resolved to amend the pattern of examination of RPW&PE coursework: The research scholar shall secure a minimum of 50% marks to pass this course. The Scholar needs to present two seminars on the approved research papers and research publication ethics before DRC. Each seminar is evaluated for 100 marks (30 marks for technical writing of the seminar content and 40 marks for technical presentation, and 30 marks for Research Publication Ethics). The DRC will evaluate the Scholar based on the average marks of two seminar presentations.

Resolution 9.2: Resolved to exempt M.Phil. Degree holders of regular mode in the concerned subject from AU Ph.D. eligibility test and from the Ph.D. course work (however, the scholars need to appear and pass the Research Paper Writing and Publication Ethics (RPW&PE) course).

Action Taken: The same has been adopted with effect from the batches admitted from July, 2022 onwards.

Resolution 10: The proposal for the 5-day classwork for students was discussed by all the participants, including the Chairman, and it was resolved to defer the matter.

Action Taken: The matter has been deferred.

Resolution 11: Resolved to defer the matter of new programs to be introduced in the next academic year to the next Academic Council meeting, as further deliberations are required.

Action Taken: The matter has been deferred.



The Chancellor suggested the following:

- a. Courses on speech processing, speech recognition may be included in BTech (AI) / BTech (AIML) programs in the IV Year.
- b. Courses on sustainability, sustainable materials may be included in the programs offered by the Civil Engineering and Chemical Engineering departments.
- c. A course on EV & Hybrid Vehicles be offered as Core Courses in the BTech (EEE) program. Further, a course on Hydrogen Vehicles may be included in the program.
- d. A course on mobile communications be offered only as Core Course in BTech (ECE) program and 5G course may be offered as an Elective Course.
- e. A course that includes topics on homomorphic encryption may be included in the BTech (Cyber Security) program.
- f. A course on Robotics be given focus in the BTech (Mechanical Engineering) program to enhance employability of the graduates.

Action Taken: The suggestions are well taken and inclusion / amendments will be presented to the BoS for its approval.



Item 3:

Ratification of the Academic Calendars for the AY 2022-23





School of Engineering

Almanac for the Academic Year 2022-23

B. Tech IV Year (I & II Semesters)

S.No	I Semester	From	То	Duration
1	1st spell of Instructions	20.06.2022	12.08.2022	8 Weeks
2	1st Midterm Examinations	16.08.2022	18.08.2022	3 Days
3	Submission of 1st Midterm marks on or before		25.08.2022	8
4	2 nd Spell of Instructions	19.08.2022	01.10.2022	6 Weeks
5	Dussera Vacation	02.10.2022	09.10.2022	8 Days
6	Continuation of 2 nd Spell of Instructions	10.10.2022	22.10.2022	2 Weeks
7	2 nd Midterm Examinations	24.10.2022	27.10.2022	4 Days
8	Submission of 2 nd Midterm marks on or before	*	03.11.2022	
9	Preparation and Practical Examinations	28.10.2022	04.11.2022	8 Days
10	Semester End Examinations	05.11.2022	19.11.2022	14 Days
Comn 21.11	nencement of Class work for IV year II seme: 2022	ster for the Acad	emic Year 20	22-23 is

To Duration From S.No II Semester 7 Weeks, 11.01.2023 1st spell of Instructions 21.11.2022 3 days 5 Days 12.01.2023 16.01.2023 Sankranti Vacation 3 Days 3 Continuation of 1st spell of Instructions 17.01.2023 19.01.2023 20.01.2023 21.01.2023 2 Days 1st Midterm Examinations 4 28.01.2023 Submission of 1st Midterm marks on or 5 before 8 Weeks 23.01.2023 22.03.2023 6 2nd spell of Instructions 7 Days Annual Day, Technical Fest, Sports Bout, and 04.03.2023 11.03.2023 7 other co-curricular and extracurricular events 23.03.2023 25.03.2023 3 Days 2nd Midterm Examinations 8 Submission of 2nd Midterm marks on or 31.03.2023 9 before

Preparation and Practical Examinations

Semester End Examinations

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04.04.2023

17.04.2023

26.03.2023

05.04.2023

10 Days

2 Weeks

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School of Engineering

Almanac for the Academic Year 2022-23

B. Tech III Year (I & II Semesters)

S.No	I Semester	From	To	Duration
1	1st spell of Instructions	18.07.2022	09.09.2022	8 Weeks
2	1st Midterm Examinations	12.09.2022	14.09.2022	3 Days
3	Submission of 1 st Midterm marks on or before		21.09.2022	
4	2 nd Spell of Instructions	15.09.2022	01.10.2022	2 Weeks
5	Dussera Vacation	02.10.2022	09.10.2022	8 Days
6	Continuation of 2 nd Spell of Instructions	10.10.2022	16.11.2022	6 Weeks
7	2 nd Midterm Examinations	17.11.2022	19.11.2022	3 Days
8	Submission of 2 nd Midterm marks on or before		26.11.2022	
9	Preparation and Practical Examinations	20.11.2022	30.11.2022	11 Days
10	Semester End Examinations	01.12.2022	14.12.2022	14 Days
Comn 15.12.	nencement of Class work for III years II seme 2022	ester for the Aca	demic Year 20)22-23 is

			Duration
1 st spell of Instructions	15.12.2022	11.01.2023	4 Weeks
Sankranti Vacation	12.01.2023	16.01.2023	5 Days
Continuation of 1st spell of Instructions	17.01.2023	10.02.2023	4 Weeks
1st Midterm Examinations	13.02.2023	15.02.2023	3 Days
Submission of 1st Midterm marks on or before		22.02.2023	
2 nd spell of Instructions	16.02.2023	15.04.2023	8 Weeks
Annual Day, Technical Fest, Sports Bout, and other co-curricular and extracurricular events	04.03.2023	11.03.2023	7 Days
2 nd Midterm Examinations	17.04.2023	19.04.2023	3 Days
Submission of 2 nd Midterm marks on or before		26.04.2023	
Preparation and Practical Examinations	20.04.2023	30.04.2023	11 Days
Semester End Examinations	01.05.2023	12.05.2023	2 Weeks
nencement of Class work for IV year I semester 12023			
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	Continuation of 1st spell of Instructions 1st Midterm Examinations Submission of 1st Midterm marks on or before 2nd spell of Instructions Annual Day, Technical Fest, Sports Bout, and other co-curricular and extracurricular events 2nd Midterm Examinations Submission of 2nd Midterm marks on or before Preparation and Practical Examinations Semester End Examinations sencement of Class work for IV year I semester	Continuation of 1st spell of Instructions 17.01.2023 1st Midterm Examinations 13.02.2023 Submission of 1st Midterm marks on or before 2nd spell of Instructions Annual Day, Technical Fest, Sports Bout, and other co-curricular and extracurricular events 2nd Midterm Examinations 17.04.2023 Submission of 2nd Midterm marks on or before Preparation and Practical Examinations 20.04.2023 Semester End Examinations 01.05.2023	Continuation of 1 st spell of Instructions 17.01.2023 10.02.2023 1 st Midterm Examinations 13.02.2023 15.02.2023 Submission of 1 st Midterm marks on or before 22.02.2023 2nd spell of Instructions 16.02.2023 15.04.2023 Annual Day, Technical Fest, Sports Bout, and other co-curricular and extracurricular events 04.03.2023 11.03.2023 2nd Midterm Examinations 17.04.2023 19.04.2023 Submission of 2 nd Midterm marks on or before 26.04.2023 Preparation and Practical Examinations 20.04.2023 30.04.2023 Semester End Examinations 01.05.2023 12.05.2023 Benester End Examinations 01.05.2023 12.05.2023

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Almanac for the Academic Year 2022-23

B. Pharmacy IV Year (I & II Semesters)

S.No	I Semester	From	То	Duration
1	1st spell of Instructions	20.06.2022	12.08.2022	8 Weeks
2	1st Midterm Examinations	16.08.2022	18.08.2022	3 Days
3	Submission of 1st Midterm marks on or before		25.08.2022	
4	2 nd Spell of Instructions	19.08.2022	01.10.2022	6 Weeks
5	Dussera Vacation	02.10.2022	09.10.2022	8 Days
6	Continuation of 2 nd Spell of Instructions	10.10.2022	22.10.2022	2 Weeks
7	2 nd Midterm Examinations	24.10.2022	27.10.2022	4 Days
8	Submission of 2 nd Midterm marks on or before		03.11.2022	
9	Preparation and Practical Examinations	28.10.2022	04.11.2022	8 Days
10	Semester End Examinations	05.11.2022	19.11.2022	14 Days
Comn 21.11.	nencement of Class work for IV year II semes 2022	ster for the Acad	emic Year 202	22-23 is

S.No	II Semester	From	To	Duration
1	1st spell of Instructions	21.11.2022	11.01.2023	7 Weeks, 3 days
. 2	Sankranti Vacation	12.01.2023	16.01.2023	5 Days
3	Continuation of 1st spell of Instructions	17.01.2023	19.01.2023	3 Days
4	1st Midterm Examinations	20.01.2023	21.01.2023	2 Days
5	Submission of 1st Midterm marks on or before		28.01.2023	
6	2 nd spell of Instructions	23.01.2023	22.03.2023	8 Weeks
7	Annual Day, Technical Fest, Sports Bout, and other co-curricular and extracurricular events	04.03.2023	11.03.2023	7 Days
8	2 nd Midterm Examinations	23.03.2023	25.03.2023	3 Days
9	Submission of 2 nd Midterm marks on or before		31.03.2023	
10	Preparation and Practical Examinations	26.03.2023	04.04.2023	10 Days
11	Semester End Examinations	05.04.2023	17.04.2023	2 Weeks
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Almanac for the Academic Year 2022-23

B. Pharmacy III Year (I & II Semesters)

S.No	I Semester	From	To	Duration
1	1st spell of Instructions	22.08.2022	01.10.2022	6 Weeks
2	Dussera Vacation	02.10.2022	09.10.2022	8 Days
3	Continuation of 1st spell of Instructions	10.10.2022	19.10.2022	2 Weeks
4	1st Midterm Examinations	20.10.2022	22.10.2022	3 Days
5	Submission of 1st Midterm marks on or before		03.11.2022	
6	2 nd Spell of Instructions	24.10.2022	17.12.2022	8 Weeks
7	2 nd Midterm Examinations	19.12.2022	21.12.2022	3 Days
8	Submission of 2 nd Midterm marks on or before		28.12.2022	
9	Preparation and Practical Examinations	22.12.2022	30.12.2022	9 Days
10	Semester End Examinations	31.12.2022	11.01.2023	12 Days
Comn 17.01.	nencement of Class work for III year II semes 2023	ster for the Acad	emic Year 202	22-23 is

S.No	II Semester	From	To	Duration
1	1st spell of Instructions	17.01.2023	10.03.2023	8 Weeks
2	Annual Day, Technical Fest, Sports Bout, and other co-curricular and extracurricular events	04.03.2023	11.03.2023	7 Days
3	1st Midterm Examinations	13.03.2023	15.03.2023	3 Days
4	Submission of 1 st Midterm marks on or before		22.03.2023	
5	2 nd spell of Instructions	16.03.2023	06.05.2023	8 Weeks
6	2 nd Midterm Examinations	08.05.2023	10.05.2023	3 Days
7	Submission of 2 nd Midterm marks on or before		17.05.2023	
8	Preparation and Practical Examinations	11.05.2023	19.05.2023	9 Days
9	Semester End Examinations	20.05.2023	31.05.2023	2 Weeks
Comn 12.06	nencement of Class work for IV year I semester .2023			
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			Comer	
		-		

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School of Pharmacy Almanac for the Academic Year 2022-23

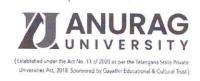
Pharm. D III Year

S. No	III Year	From	То	Duration
1	1st Spell of Instructions	01.07.2022	22.09.2022	12 Weeks
2.	1 st Midterm Examinations	23.09.2022	01.10.2022	8 Days
3	Dussera Vacation	02.10.2022	09.10.2022	7 Days
4	Submission of 1st Midterm marks on or before	15.10.2022		
5	2 nd Spell of Instructions	10.10.2022	31.12.2022	12 Weeks
6	2 nd Midterm Examinations	02.01.2023	11.01.2023	1 Week
7	Sankranti Vacation	12.01.2023	16.01.2023	5 Days
8	Submission of 2 nd Midterm marks on or before		20.01.2023	
9	3 rd Spell of Instructions	17.01.2023	07.04.2023	12 Weeks
10	Annual Day, Technical Fest, Sports Bout, and other co-curricular and extracurricular events	04.03.2023	11.03.2023	7 Days
11	3 rd Midterm Examinations	10.04.2023	15.04.2023	1 Week
12	Submission of 3 rd Midterm marks on or before		22.04.2023	
13	Preparation and Practical Examinations	16.04.2023	26.04.2023	11 Days
14	Year End Examinations	27.04.2023		-
15	Summer Vacation	13.05.2023	11.06.2023	2 Weeks
Comm	encement of Class work for the Academic Year	2023-24 is 1	2.06.2023	

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Almanac for the Academic Year 2022-23

Pharm. D IV & V Years

S. No	Academic details	From	To	Duration
1	1st Spell of Instructions	01.06.2022	23.08.2022	12 Weeks
2	1st Midterm Examinations	24.08.2022	01.09.2022	8 Days
3	Submission of 1st Midterm marks on or before		08.09.2022	
4	2 nd Spell of Instructions	02.09.2022	01.10.2022	4 Weeks
5	Dussera Vacation	02.10.2022	09.10.2022	8 Days
6	Continuation of 2 nd Spell of Instructions	10.10.2022	03.12.2022	8 Weeks
7	2 nd Midterm Examinations	05.12.2022	14.12.2022	10 Days
8	Submission of 2 nd Midterm marks on or before	21.12.2022		
9	3 rd Spell of Instructions	15.12.2022	11.01.2023	4 Weeks
10	Sankranthi Vacation	12.01.2023	16.01.2023	5 Days
11	Continuation of 3 rd Spell of Instructions	17.01.2023	13.03.2023	8 Weeks
12	Annual Day, Technical Fest, Sports Bout, and other co-curricular and extracurricular events	04.03.2023	11.03.2023	7 Days
13	3 rd Midterm Examinations	14.03.2023	23.03.2023	9 Days
14	Submission of 3 rd Midterm marks on or before		30.03.2023	
15	Preparation and Practical Examinations	24.03.2023	09.04.2023	2 Weeks
16	Year End Examinations	10.04.2023	22.04.2023	2 Weeks
17	Summer Vacation	23.04.2023	30.05.2023	5 Weeks
Commencement of Class work for the Academic Year 2023-24 is 01.06.2023				

Registrar

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Almanac for the Academic Year 2022-23

Pharm. D VI Year

S. No	VI Year	From	To	Duration
1	Internship in General Ward	01.06.2022	30.11.2022	6 Months
	Report submission of Internship in General Ward			
3	Internship in Specialty Ward-I	02.12.2022	31.01.2023	2 Months
4	Report submission of Internship in Specialty Ward-I		01.02.2023	
5	Internship in Specialty Ward-II	02.02.2023	03.04.2023	2 Months
6	Report submission of Internship in Specialty Ward-II		04.04.2023	
7	Internship in Specialty Ward-III	05.04.2023	03.06.2023	2 Months
8	Report submission of Internship in Specialty Ward-III		05.06.2023	
9	Final Viva of Internship		06.06.2023	

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Almanac for the Academic Year 2022-23

Pharm. D (PB) III Year

S.	No	III Year	From	To	Duration
	1	Internship in General Ward	20.06.2022	17.12.2022	6 Months
	2	Report submission of Internship in General Ward		19.12.2022	
7	3	Internship in Specialty ward-I	20.12.2022	18.02.2023	2 Months
3	4	Report submission of Internship in Specialty Ward-I	20.02.2023		
	5	Internship in Specialty Ward-II	21.02.2023	19.04.2023	2 Months
	6	Report submission of Internship in Specialty Ward-II	20.04.2023		
	7	Internship in Specialty Ward-III	21.04.2023	20.06.2023	2 Months
	8	Report submission of Internship in Specialty Ward-III		21.06.2023	
	9	Final Viva of Internship		22.06.2023	

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School of Management

Almanac for the Academic Year 2022-23

MBA II Year (I & II Semesters)

S. No	I Semester	From	То	Duration
I	1 st spell of Instructions	01.09.2022	01.10.2022	4 Weeks
2	Dussera Vacation	02.10.2022	09.10.2022	8 Days
3	Continuation of 1st spell of Instructions	10.10.2022	02.11.2022	4 Weeks
4	1st Midterm Examinations	03.11.2022	05.11.2022	3 Days
5	Submission of 1st Midterm marks on or before	11.11.2022		
6	2 nd Spell of Instructions	07.11.2022	31.12.2022	8 Weeks
7	2 nd Midterm Examinations	02.01.2023	04.01.2023	3 Days
8	Submission of 2 nd Midterm marks on or before		10.01.2023	
9	Preparation and Practical Examinations	05.01.2023	16.01.2023	11 Days
10	Sankranthi vacation	12.01.2023	16.01.2023	5 Days
11	Semester End Examinations	17.01.2023	27.01.2023	12 Days
Commencement of the Class work for II Year II Semester for the Academic Year 2022-23 is 30.01.2023				

S. No	II Semester	From	То	Duration
l	1st spell of Instructions	30.01.2023	22.03.2023	8 Weeks
2	Annual Day, Technical Fest, Sports Bout, and other co-curricular and extracurricular events	04.03.2023	11.03.2023	7 Days
3	1st Midterm Examinations	23.03.2023	25.03.2023	3 Days
4	Submission of 1st Midterm marks on or before	02.04.2023		
5	2 nd spell of Instructions	27.03.2023	17.05.2023	8 Weeks
6	2 nd Midterm Examinations	18.05.2023	20.05.2023	3 Days
7	Submission of 2 nd Midterm marks on or before	17.05.2023		
8	Preparation and Practical Examinations	11.05.2023	19.05.2023	9 Days
9	Semester End Examinations	20.05.2023	31.05.2023	2 Weeks

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School of Management

Almanac for the Academic Year 2022-23

BBA II Year (I & II Semesters)

S.No	I Semester	From	То	Duration	
1	1st spell of Instructions	01.09.2022	01.10.2022	4 Weeks	
2	Dussera Vacation	02.10.2022	09.10.2022	8 Days	
3	Continuation of 1st spell of Instructions	10.10.2022	02.11.2022	4 Weeks	
4	1 st Midterm Examinations	03.11.2022	05.11.2022	3 Days	
5	Submission of 1st Midterm marks on or before	11.11.2022			
6	2 nd Spell of Instructions	07.11.2022	31.12.2022	8 Weeks	
7	2 nd Midterm Examinations	02.01.2023	04.01.2023	3 Days	
8	Submission of 2 nd Midterm marks on or before		10.01.2023		
9	Preparation and Practical Examinations	05.01.2023	16.01.2023	11 Days	
10	Sankranthi vacation	12.01.2023	16.01.2023	5 Days	
11	Semester End Examinations	17.01.2023	27.01.2023	12 Days	
Commencement of the Class work for II Year II Semester for the Academic Year 2022-23 is					
30.01.	30.01.2023				

S.No	II Semester	From	То	Duration
1	1st spell of Instructions	30.01.2023	22.03.2023	8 Weeks
2	Annual Day, Technical Fest, Sports Bout, and other co-curricular and extracurricular events	04.03.2023	11.03.2023	7 Days
3	1st Midterm Examinations	23.03.2023	25.03.2023	3 Days
4	Submission of 1st Midterm marks on or before	02.04.2023		
5	2 nd spell of Instructions	27.03.2023	17.05.2023	8 Weeks
6	2 nd Midterm Examinations	18.05.2023	20.05.2023	3 Days
7	Submission of 2 nd Midterm marks on or before	17.05.2023		
8	Preparation and Practical Examinations	11.05.2023	19.05.2023	9 Days
9	Semester End Examinations	20.05.2023	31.05.2023	2
				Weeks
Commencement of the Class work for III Year I Semester for the Academic Year 2023-24 is				

12.06.2023

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(Established under the Act No. 13 of 2020 as per the Telangana State Private Universities Act, 2018, Sponsored by Gayathri Educational & Cultural Trust.)

School of Engineering

Almanac for the Academic Year 2022-23

B. Tech II Year (I & II Semesters)

S.No	I Semester	From	To	Duration
1	1st spell of Instructions	29.08.2022	01.10.2022	5 Weeks
2	Dussera Vacation	02.10.2022	09.10.2022	8 Days
3	Continuation of 1st Spell of Instructions	10.10.2022	26.10.2022	3 Weeks
4	1st Midterm Examinations	27.10.2022	29.10.2022	3 Days
5	Submission of 1st Midterm marks on or before	05.11.2022		
6	2 nd Spell of Instructions	31.10.2022	21.12.2022	8 Weeks
7	2 nd Midterm Examinations	22.12.2022	24.12.2022	3 Days
8	Submission of 2 nd Midterm marks on or before		31.12.2022	-
9	Preparation Holidays	25.12.2022	30.12.2022	6 Days
10	Semester End Examinations	31.12.2022	11.01.2023	12 Days
11	Sankranti Vacation	12.01.2023	16.01.2023	5 Days
12	Practical Examinations	17.01.2023	19.01.2023	3 Days
12	Practical Examinations nencement of Class work for II Year II Semeste	17.01.2023	19.01.20	23

S.No	II Semester	From	To	Duration	
1	1st spell of Instructions	20.01.2023	15.03.2023	8 Weeks	
2	Annual Day, Technical Fest, Sports Bout, and other co-curricular and extracurricular events	04.03.2023	11.03.2023	7 Days	
3	1st Midterm Examinations	16.03.2023	18.03.2023	3 Days	
4	Submission of 1st Midterm marks on or before	25.03.2023			
5	2 nd spell of Instructions	20.03.2023	09.05.2023	8 Weeks	
6	2 nd Midterm Examinations	10.05.2023	12.05.2023	3 Days	
7	Submission of 2 nd Midterm marks on or before		19.05.2023		
8	Preparation and Practical Examinations	13.05.2023	21.05.2023	9 Days	
9	Semester End Examinations	22.05.2023	02.06.2023	12 Days	
10	Summer Vacation	03.06.2023	11.06.2023	9 Days	
	Commencement of Class work for III-year I semester for the Academic Year 2023-24 is 12.06.2023				

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Item 4:

Approval of the Academic Regulations (R21) of the B. Sc. (Hons.) Agriculture Sciences



ACADEMIC REGULATIONS (AU-R21)

For the B. Sc. (Hons) Agriculture Science Program

With effect from the Academic Year 2021-22



ANURAG UNIVERSITY

Ghatkesar (M), Medchal-Malkajgiri (Dist), Hyderabad, Telangana 500088 www.anurag.edu.in

November, 2021



Academic Regulations for B.Sc. (Hons) Agriculture Science with effect from the Academic Year 2021-22

1. Title and Duration of the Program

- 1.1 These regulations shall be called ANURAG University, School of Agricultural sciences UG Regulations 'Governing the Undergraduate programs of study leading to the award of B.Sc. (Hons) Agriculture Degree in the Faculty of Agriculture. These regulations come into force with effect from the academic year 2021-22.
- 1.2 The B.Sc. (Hons) Agriculture program duration shall be four academic years divided into eight semesters and each semester having 16 weeks of instruction.
- 1.3 Students admitted to the B.Sc. (Hons) Agriculture program shall have to complete the course of study within a maximum time frame of 6 years (4+2 years) from the year of admission. Relaxation sought on genuine grounds will be referred to the Board of Management.

2. Admission Procedure

- A candidate for admission into the B.Sc. (Hons) Agriculture program must have passed the Intermediate Examination of the Board of Intermediate Education, Government of Telangana/any other state with Physics, Chemistry and Biology as optional courses or the ranks obtained in the Anurag University common entrance test/ EAMCET/ ICAR central or state level tests or any other test prescribed by the University.
- 2.2 Rule of Reservation is applicable as per Section 33 of the Telangana State Private Universities Act No. 11 of 2018 and Rule 10 of the G.O.Ms. No.26 [Higher Education (UE.1) Department], Dt. 20-08-2019.

3. Program of Study and Code

Program	Code
B.Sc. (Hons) Agriculture Sciences	01



4. Credits

- 4.1 The details of the credits, courses and syllabi of the under graduate courses shall be as prescribed by the Academic Council from time to time.
- 4.2 The following is the credit allocation table.

Course	Credits
1 Hour Lecture (L) per week	1
1 Hour Tutorial (T) per week	1
2 Hour Practical (P) per week	1
Mini project	02
Comprehensive Viva Voce	02
Seminar	02
Project	20

5. Distribution and Weightage of Marks

- 5.1 The performance of a student in a semester shall be evaluated course-wise for a maximum of 100 marks in each theory and practical course. In addition, industry-oriented mini-project, seminar, comprehensive viva-voce and project work shall be evaluated for 100 marks each (Annexure-I).
- 5.2 The distribution of marks for Continuous Internal Evaluation (CIE) and the Semester End Examination (SEE) along with the minimum pass percentage shall be as follows:

Course	Continuous Internal	Semester End	*Min. Pass Percentage	Percentage
	Evaluation (CIE)	Examination (SEE)	in (SEE)	(CIE+SEE)
Theory	50	50	50	50
Laboratory/Practical	50	50	50	50
Industry-Oriented mini- Project, to be taken up duringthe vacation after III Year II Semester examinations and evaluated in 4th year I Sem.	0	100	50	50
Comprehensive viva- vocein IV Year II Semester	0	100	50	50
Project Work	50	50	50	50



- 5.3 For theory courses the distribution shall be 50 marks for Continuous Internal Evaluation (CIE) and 50 marks for the Semester End Examination (SEE).
- 5.4 Continuous Internal Evaluation (CIE):
 - 5.4.1 The CIE has two components namely:
 - a. Mid Term Examinations (refer to table 5.7: Distribution of Marks)
 - b. Assignment/Seminars/Projects/Group Activities and Practicals (refer to table 5.7: Distribution of Marks)

i. Midterm examination:

For theory subjects, there shall be two midterm examinations and two assignments as a part of continuous internal evaluation. Each midterm examination shall be conducted for the duration of 90 minutes and the question paper consists of Part-A (Objective type) and Part-B (Long Answers).

The First midterm examination shall be conducted for 2.5 units of syllabus at the end of 8 weeks of instruction and Second midterm examination shall be conducted for remaining 2.5 units at the end of 16 weeks of instruction.

Assignment / Seminars / Projects / Group Activities:

The Assignment/Seminars/Projects/Group Activities should be submitted before the conduct of the second midterm examination.

5.4.2 The average of two midterm examinations shall be taken as the final marks secured by each candidate.

5.5 **Semester End Examinations (SEE):**

- 5.5.1 The semester end examination will be conducted for 50 marks which consist of two parts viz., i). Part-A for 20 marks, ii). Part –B for 30 marks.
- 5.5.2 Part-A is compulsory.
- 5.5.3 Part-B consists of five questions covering one question (may contain sub-questions) from each unit of the syllabus carrying 6 marks each. For each question there will be an "either" "or" choice



- (that means there will be two questions from each unit and the student should have to answer any one of them).
- 5.5.4 For courses with only practical, there shall be a continuous internal evaluation during a semester for 50 marks and Semester end practical external examination carries 50 marks.
- 5.5.5 The practical end semester examination shall be conducted with an external examiner along with one internal examiner. The external examiner shall be appointed by the Dean-Examinations from the list of panels of examiners approved by the Vice-Chancellor.
- 5.5.6 **Mini-Project**: There shall be mini-Project, to be taken up during the vacation after III Year II Semester examinations. However, the mini project and its report shall be evaluated in IV Year I Semester. The industry oriented mini project shall be submitted in report form and should be presented before the committee, which shall be evaluated for 100 marks. The committee consists of the head of the department, the supervisor of mini project and a senior faculty member of the department nominated by the Dean-School of Agriculture. There shall be no CIE marks for industry oriented mini project.
- 5.5.7 Seminar presentation: There shall be a seminar presentation in IV Year II Semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his/her understanding of the topic, and submit it to the Department. It shall be evaluated by the committee consisting of Head of the Department, seminar Supervisor and faculty member nominated by the Dean-School of Agriculture. The seminar report shall be evaluated as CIE for 100 marks.
- 5.5.8 **Comprehensive viva-voce**: There shall be a comprehensive viva-voce in IV Year II Semester. The comprehensive viva-voce shall be conducted by a committee consisting of the Head of the Department and two senior faculty members of the department. The comprehensive viva-voce is intended to assess the students



understanding of the courses he studied during the program. The comprehensive viva-voce is evaluated as SEE for 100 marks.

- 5.5.9 **Project Work**: Out of a total of 100 marks for the project work, 50 marks shall be for CIE and 50 marks for the SEE. The SEE shall be based on the two seminars given by each student on the topic of his/her interest. The SEE (viva-voce) shall be conducted by the committee consists of an (i) External examiner appointed by Dean Examinations on the recommendation of Chairperson, BOS, (ii) Head of the department, (iii) Supervisor of the project and (iv) Senior faculty member of the department. The evaluation of project work shall be conducted at the end of the IV Year II Semester.
- 5.5.10 The Laboratory marks and the CIE awarded by the faculty are subject scrutiny and scaling the University to by whenever/wherever necessary. In such cases, the CIE and laboratory marks awarded by the teacher will be referred to a committee consisting of Chairperson BOS/HOD, Examinations/COE and subject expert. The committee will arrive at a scaling factor and the marks will be scaled accordingly. The recommendations of the committee are submitted to the Vice-Chancellor and his decision is final. The laboratory records and internal test papers shall be preserved for a period of two years or as specified by the University from time to time.
- 5.6 Candidates shall be permitted to apply for recounting/revaluation of SEE scripts within the stipulated period with payment of prescribed fee.



5.7 **Distribution of Marks:**

Course type	CIE	SEE
Courses with theory and practical	 Mid semester examination: 30 marks [12 marks for Part A which is compulsory + 18 marks for Part-B] Assignment: 5 marks Practical:15 marks [5 marks for record and others + 10 marks for practical examination] 	50 marks (20 marks for Part-A which is compulsory + 30 marks for Part-B)
Theory Courses only	 Mid semester examination = 40 marks [16 marks for Part A which is compulsory + 24 marks for Part-B] Assignment =10 marks 	50 marks (20 marks for Part-A which is compulsory + 30 marks for Part-B)
Practical Courses only	 Class work and Record: 30 marks Assignment: 10 marks Viva-voce: 10 marks 	50 marks

5.8 **Recounting:** The totaling of the marks awarded shall be verified in the answer script and corrected if there is any mistake.

5.9 Revaluation:

- a) The answer scripts of the candidate applied for revaluation are evaluated by two subject experts independently other than the original valuer.
- b) If the difference of marks between these two valuations is 15% or more,it will be sent for third valuation to another subject expert.
- c) Nearest of two valuations out of three will be considered and the average of these two will be taken as the final marks obtained.
- d) If the difference of the final marks after revaluation is>=15% of original marks, then the revaluation marks are considered for declaring the result.
- e) If the revaluation marks are less than the original marks, the original marks remain same and there is no change in the result.

5.10 Challenge Valuation:

The candidates who have applied for revaluation and not satisfied with the result are only eligible to apply for challenge valuation by paying the prescribed fee in the form of DD payable to the Registrar, Anurag University.



- a) On receipt of the DD, a photocopy of the answer booklet shall be given to the student.
- b) The paper will be evaluated in the presence of the student by a senior faculty member appointed by the University.
- c) If there is any change in the marks >= 15% of the maximum marks, the new marks will be awarded to the student. Otherwise, there will be no change in original secured marks.
- d) If the change in marks (equal or above 15% of the maximum marks) occurs, the amount paid towards challenge valuation will be refunded. Otherwise, the student will forfeit the total amount which he/she has paid.

6. Advisory System

- 6.1 The students on their admission shall be divided into convenient batches by the Dean of the college and each batch is assigned to one of the teachers who are designated as 'Advisor'. Each student immediately after enrolment fills up all the registration cards with the guidance of his/her advisor. Among other things, the advisor shall help the students in planning the programs of their studies.
- 6.2 The advisor will establish and foster close personal relationship with students assigned to him/her during their entire stay in the college by having periodical meetings either with the entire batch of students or with each individual student as often as is considered necessary in an effort to know their problems, review their study programs and take such remedial actions as may be necessary in consultation with the teachers concerned and the Dean of Agriculture.
- 6.3 The advisor will maintain a record containing particulars of previous history of the student, courses registered and examinations appeared and grades obtained in each course in each semester as per the format prescribed by the University (Annexure 1).

7. Registration

7.1 A registration and orientation program will be conducted for the benefit of the students joining the University for the first time. A copy of the Academic regulations and syllabi will be given to the students.



- 7.2 Each student has to register for course work at the beginning of each semester as per the schedule mentioned in the academic calendar.
- 7.3 A student would be allowed to register in an additional course only if he/she satisfies all the prerequisites.
- 7.4 Departments will notify at the time of registration about the minimum number of students to be enrolled for a particular course to be offered.
- 7.5 Any student may be barred from registering for any course for specific reasons like disciplinary reasons, non-payment of fees, etc.

8. Dropping

8.1 Dropping of courses: Within four weeks after the commencement of the semester, the student may, in consultation with his / her faculty advisor, drop one or more courses. The dropped courses are not recorded in the grade card.

9. Attendance Requirements

- 9.1 A student is eligible to write the Semester end examinations only if he/ she acquire a minimum of 75% attendance in aggregate of all courses up to third year.
- 9.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted on medical grounds as approved by the Academic Council.
- 9.3 A stipulated fee shall be payable towards condonation of shortage of attendance.
- 9.4 Shortage of attendance below 65% in aggregate shall not be condoned.
- 9.5 However, in respect of women candidates who seek condonation of attendance due to pregnancy, the Vice-Chancellor may condone the deficiency in attendance to the extent of 15% (as against 10% condonation for others) on medical grounds subject to submission of medical certificate to this effect. Such condonation shall not be availed twice during the program of study.
- 9.6 Students whose shortage of attendance is not condoned are not eligible to write semester end examinations of that semester. Such students are detained and their registration for examination stands cancelled.



- 9.7 A student detained due to shortage of attendance in a semester may seek re-admission into that semester, as and when offered, within four weeks from the date of commencement of class work with the academic regulations of the batch into which he/she gets re-admitted.
- 9.8 A student will be promoted to the next semester if he/she satisfies the attendance requirement of the present semester and shall not be eligible for readmission into the same semester.
- 9.9 For all mandatory, noncredit courses offered in a semester, a student shall be declared successful or 'passed', if he/she secures >=75% attendance in such a course. A 'satisfactory participation certificate' for that mandatory course will be issued and no marks or letter grade shall be allotted.
- 9.10 Attendance of N.S.S/N.C.C Camps or Inter collegiate or Inter University or Inter State or International matches or debates or such other Inter University activities as approved by the authorities, will be taken into consideration while calculating the attendance.
- 9.11 Such leave should be availed with prior permission from the Dean- School of Agriculture and not be availed more than twice during the program of study.
- 9.12 Without any prior permission, such leave shall be treated as absence.
- 9.13 For Student Ready Programs in IV-year, 85% attendance is compulsory.

10. Passing Standards

- 10.1 Earning a Credit: A student shall be considered to have completed a course successfully and earned the credits if he/she secures an acceptable letter grade in the range 'O' to 'C'. Letter grade 'F' in any course implies failure in that course and no credits earned.
- 10.2 Semester Grade Point Average (SGPA): Semester Grade Point Average is the quotient of the total credit points obtained by a student in various courses at the end of each semester divided by the total credit hours taken by him/her in that semester. The grading is done on a 10-point scale. The GPA is to be corrected up to two decimal points.
 - SGPA = Total points scored / Total credits (of that semester)



10.3 Cumulative Grade Point Average (CGPA): Cumulative Grade Point Average is the quotient of cumulative credit points obtained by a student in all the courses taken by him/her from the beginning of the first semester of the degree course divided by the total credit hours of all the courses which he/she had completed up to the end of a specified semester from the first semester. It determines overall performance of a student in all the courses taken during a period covering more than a semester.

The CGPA and SGPA is to be corrected up to two decimal point.

SGPA = Total Credit Points Scored / Course Credits CGPA =Total Credit Points Scored / Total Credits.

% of marks = (CGPA-0.5) X 10.

- 10.4 A student shall be declared successful or 'passed' in a semester, only when he/she gets a SGPA ≥ 5.00 (at the end of that particular Semester); and a student shall be declared successful or 'passed' in the entire UG Program, only when he/she gets a CGPA ≥ 5.50; subject to the condition that he/she secures a C Grade or above in every registered course.
- 10.5 A student shall be declared successful or 'passed' in any non-credit course, if he/she secures a 'satisfactory participation certificate' for that mandatory course.
- 10.6 After the completion of each semester, a grade card or grade sheet (or transcript) shall be issued to all the registered students of that semester, indicating the letter grades and credits earned. It will show the details of the courses registered (course code, title, no. of credits etc.), grade earned credits earned, SGPA and CGPA.
- 10.7 A student shall register and put up required attendance in all courses and earn a total of 185 credits for the award of degree.
- 10.8 When a student is detained due to shortage of attendance in any semester, no grade allotments or SGPA/CGPA calculations will be given for that entire semester in which he/she is detained.
- 10.9 When a student is detained due to lack of credits in any year, he may be readmitted after fulfillment of the academic requirements, with the academic regulations of the batch into which he/she gets readmitted.



- 10.10 For readmitted candidates, if there are any professional electives / open electives, the same may also be re-registered if offered. However, if those electives are not offered in later semesters, then alternate electives may be chosen from the set of elective courses offered under that category.
- 10.11 A 10% relaxation or concession of marks in pass percentage shall be given to physically challenged students.

Promotion Rules: The Rules of promotion are as follows.

Promotion	From I Yr. to II Yr.	From II Yr. to III Yr.	From III Yr. to IV Yr.
Condition to be fulfilled	credits up to I Yr. II Sem.	50% of the total credits up to II Yr. II Sem. And all the courses of first year are to be passed	Total credits are to be cleared up to III Yr. II Sem.

11 Program Structure

11.1 The program structure is in-line with the guide lines as suggested by ICAR.

12 Grade Points

- 12.1 Marks will be awarded to indicate the performance of each student in each theory courses or lab/practical/seminar/project/mini-project etc., based on the percentage of marks obtained in both CIE and SEE taken together as specified in Item 5 above, and a corresponding letter grade shall be given.
- 12.2 A 10-point absolute grading system using the following letter grades and corresponding percentage of marks shall be followed as given below:



L	etter Grade	Grade Points	% of Marks Secured (M) (Class Intervals)
0	Outstanding	10	>=90
A+	Excellent	9	>= 80 and < 90
Α	Very Good	8	>= 70 and < 80
B+	Good	7	>= 60 and < 70
В	Average	6	>= 55 and < 60
С	Pass	5	>= 50 and < 55
F	Fail	0	< 50
Ab	Absent	0	-

- 12.3 A student obtaining 'F' grade in any subject shall be considered as 'failed' and will be required to reappear as 'supplementary candidate' in the SEE, as and when conducted. In such cases, CIE in those subject(s) will remain same as those the student obtained earlier.
- 12.4 A letter grade does not imply any specific % of marks.
- 12.5 In general, a student shall not be permitted to repeat any course (s) only for the sake of 'grade improvement' or 'SGPA/CGPA Improvement'.
- 12.6 A student earns grade point (GP) in each course, on the basis of the letter grade obtained by him in that course (excluding mandatory non-credit courses). Then the corresponding 'credit points' (CP) are computed by multiplying the grade point with credits for that particular course.

Credit Points (CP) = Grade Point (GP) x Credits (for a course)

13 Award of Class

13.1 A student who registers for all the specified courses as listed in the program and secures the required number of 185 credits (with CGPA >= 5.0), within eight academic years from the date of commencement of the first academic year, shall be declared to have 'qualified' for the award of the B. Sc. (Honors) Agricultural Science degree.



CGPA	Class	Condition
		Condition
CGPA ≥ 8.00	First Class with Distinction	 Should pass all the courses in semester 'Regular examinations' and should complete the program in 4 years of time. Should not have been detained or prevented from writing the semester end examinations in any semester due to shortage of attendance or any other reason. The Students who secure CGPA ≥ 8.00, but not fulfilling the conditions for "First Class with Distinction" shall be awarded First Class only.
6.50 ≤ CGPA < 8.00	First Class	
5.50 ≤ CGPA < 6.50	Second Class	
5.0 ≤ CGPA <5.50	Pass Class	

13.2 The CGPA can be converted to equivalent percentage of marks by using the following formula:

Percentage (%) of marks = (CGPA - 0.5) X10

14 Supplementary Examinations

14.1 A student eligible to appear for semester end examinations in a course, but absent/failed in that examination, may write the exam in that course during supplementary examinations. In such cases, CIE assessed earlier for that course will be carried over and added to the marks to be obtained in the supplementary examinations.

15 Withholding of Results

15.1 If the student has not paid the dues, if any, to the University or if any case of indiscipline is pending against him, the result will be withheld, and he will not be allowed into the next semester. In such cases the matter will be referred to the academic council. The decision of the academic council is final.



16 Transcripts

16.1 After successful completion of the total Program of study, a Transcript containing performance of all academic years/semesters will be issued as a final record. Duplicate transcripts will also be issued if required after the payment of requisite fee.

17 Convocation

- 17.1 The University shall conduct convocation ceremony to confer the degree(s).
- 17.2 The University shall institute Prizes and Awards to meritorious students during convocation.

18 Termination from the program

The admission of a student to the program may be terminated in the following circumstances:

- 18.1 The student fails to satisfy the requirements of the program within the maximum period stipulated for that program.
- 18.2 The student fails to satisfy the norms of discipline specified by the university from time to time.

19 Non-Gradial Courses (Mandatory Courses)

- 19.1 All the courses designated as mandatory course is a compulsory requirement for all students for the award of degree.
- 19.2 These activities carry no credits and are evaluated as satisfactory/ unsatisfactory.
- 19.3 Minimum attendance requirement as per the regulations is compulsory for completing the mandatory courses.

20 Amendments

20.1 The regulations hereunder are subject to amendments as may be made by Academic Council from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already undergoing the program).



Item 5:

Approval of the course structure of the 2nd, 3rd and 4th years of B. Sc. (Hons.) Agriculture Sciences



SCHOOL OF AGRICULTURAL SCIENCES

Lr.No .AU/Est.BOS/Agri

Dated 26-07-2022

Minutes Of The First Board Of Studies Meeting To Finalize The Syllabus For B.Sc (HONS) Agriculture Held **On 12**th **JUNE 2021 At 10.00 AM** Virtually. Submitted for the approval of academic council meeting to be held on 30/07/2022.

Members Present

- 1. Dr. P.Narayan Reddy, Dean, School of Agricultural Sciences, Anurag University.
- 2. Dr. M. Devender Reddy, Dean, M.S. Swaminathan School of Agriculture, Centurion University of Technology and Management, Gajapathi, Pitamahal, Orissa
- 3. Dr. P.Chandrasekhar Rao, Dean of P.G. studies (Retired), PJTSAU, Rajendranagar, Hyderabad
- 4. Dr. A.Manohar Rao, Professor(Retired), PJTSAU, Hyderabad
- 5. Dr. D.Raja Ramreddy, Dean of Student Affairs(Retired), PJTSAU, Rajendranagar
- 6. Sri. G.V. Subba Reddy, Vice President Marketing, Coramadel International Ltd, Secunderabad
- 7. Dr. P. Krishna Reddy, Professor, IIIT, Gachibowli, Hyderabad
- 8. Dr. M.P. Thakur, Dean faculty of agriculture Indira Gandhi Krishi Vishwa Vidyalaya, Raipur
- 9. Dr. B. Sharath Babu Director (Retired) NBPGR, Hyderabad
- Dr. Kareemulla (Special Invitee) Senior scientist, NAARM, Rajendranagar, Hyderabad



The first meeting of board of studies committee constituted for finalizing the syllabus of B.Sc (Hons) Agriculture course was conducted on 12-06-2021 virtually under the chairmanship of Dr.

P. Narayan Reddy, Dean School of Agricultural Sciences Anurag University. It is decided to follow the syllabus recommended by Indian Council of Agricultural Research (ICAR) with some changes as permitted by ICAR to suit local needs and finalized the following course structure for four years and the syllabus for the first year.

- 1. It is resolved to introduce a course on I T workshop in the first year
- 2. To introduce Python language course in the second year
- 3. To introduce an elective course on IOT, AI and machine learning applications in agriculture
- 4. Resolved to discuss and finalize changes in second and third year syllabus in Agricultural economics to include more topics in marketing and market intelligence
- 5. Resolved to follow the following credits for the four years duration of the course

Total number of credits = 185

Upto Third year=145(Theory 79+Practical 57) + Elective Courses= 09

Fourth year first semester: Rural Agricultural Work Experience (RAWE)/ Agro Industrial Attachment (AIA)=20

Second semester: Experiential Learning Programme (ELP)/ Hands on Training (HOT) 20



DEPARTMENT WISE DISTRIBUTION OF COURSES AGRONOMY

S. No	Course No	Department and Title of Course	Credits
1	A11101	Agriculture Heritage*	1(1+0)*
2	A11102	Fundamentals of Agronomy	3(2+1)
3	A12103	Introductory Agro meteorology and Climate Change	2 (1+1)
4	A12104	Introduction to Forestry	2 (1+1)
5	A13201	Crop Production Technology I (Cereals, Millets and Pulses)	3 (2+1)
6	A14202	Crop Production Technology –II	3 (2+1)
7	A14203	Farming Systems and Sustainable Agriculture	1 (1+0)
8	A14204	Irrigation Water Management	2 (1+1)
9	A15301	Geo informatics and Nanotechnology for Precision Farming	2 (1+1)
10	A15302	Practical Crop Production	1 (0+1)
11	A16303	Rain fed Agriculture & Watershed Management	2(1+1)
12	A16304	Principles of Organic Farming	2(1+1)
TOTAL 24(14+10)			

GENETICS AND PLANT BREEDING

S. No	Course No	Department and Title of Course	Credits
1	A11111	Fundamentals of Genetics	3(2+1)
2	A13211	Fundamentals of Plant Breeding	3(2+1)



3	A15311	Crop Improvement-I(Cereals, Millets, Pulses an Oilseeds)	2(1+1)	
4	A16312	Crop Improvement-II (Fibres, Sugars, Starches, Narcotics, Vegetables, Fruits and Flowers)	2(1+1)	
5	A15313	Intellectual Property Rights	1(1+0)	
6	A16314	Principles of Seed Technology	3(2+1)	
	TOTAL			
	SOIL SO	CIENCE AND AGRICULTURAL CHEMISTRY		
S. No	Course No	Department and Title of Course	Credits	
1	A12121	Fundamentals of Soil Science	3(2+1)	
2	A12121 A14221	Fundamentals of Soil Science Manures, Fertilizers and Soil Fertility Management	3(2+1)	
•	1 1 1 1 1 1	Manures, Fertilizers and Soil Fertility	, ,	

ENTOMOLOGY

S. No	Course No	Department and Title of Course	Credits
1	A12131	Fundamentals of Entomology I (Insect Morphology and Taxonomy)	3(2+1)
2	A13231	Fundamentals of Entomology II (Insect Ecology and Concepts of IPM)	2(1+1)
3	A15331	Pests of Field crops &Stored Grain and their Management	3(2+1)
4	A16332	Pest of Horticultural Crops and their Management and Beneficial insects	3(2+1)
TOTAL			11(7+4)



AGRICULTURAL ECONOMICS

S. No	Course No	Department and Title of Course	Credits
1	A11141	Fundamentals of Economics	3(3+0)
2	A13241	Agricultural Finance and Co-operation	2 (1+1)
3	A14242	Agricultural Marketing, Trade and Prices	3 (2+1)
4	A16341	Farm Management, Production and Resource Economics	2 (1+1)
TOTAL			10(7+3)

AGRICULTURAL ENGINEERING

S. No	Course No	Department and Title of Course	Credits
1	A12151	Soil and Water Conservation Engineering	2(1+1)
2	A13251	Farm Machinery and Power	2 (1+1)
3	A14252	Renewable Energy and Green Technology	2 (1+1)
4	A15351	Protected Cultivation and Post-harvest technologies	2 (1+1)
TOTAL			8(4+4)

CROP PHYSIOLOGY

S. No	Course No	Department and Title of Course	Credits
1	A12162	Fundamentals of Crop Physiology	3(2+1)
2	A13261	Eco-physiology	2(1+1)
3	A15361	Environmental Studies and Disaster Management	2(1+1)
TOTAL			9(5+4)

PLANT PATHOLOGY



S. No	Course No	Department and Title of Course	Credits
1	A12171	Fundamentals of Plant Pathology I	3(2+1)
2	A13271	(Plant Pathogens – An Introduction) Fundamentals of Plant Pathology II	2(1+1)
3	A15371	(Plant Pathology Principles) Diseases of Field and Horticultural	3 (2+1)
4	A16372	Crops and their Management -I (Field Crops) Diseases of Field and Horticultural Crops	2 (1+1)
5	A15373	and their Management-II (Horticultural Crops) Principles of Integrated Pest and Disease Management	2(1+1)
TOTAL			12(7+5)

HORTICULTURE

S. No	Course No	Department and Title of Course	Credits
1	A11181	Fundamentals of Horticulture	2 (1+1)
2	A12182	Production Technology of Fruits and Plantation Crops	2 (1+1)
3	A13281	Production Technology for Vegetables and Spices	2 (1+1)
4	A14282	Production Technology for Ornamental Crops, Medicinal & Aromatic Plants and Landscaping	2 (1+1)
5	A16381	Post-harvest Management and Value Addition of Fruits and Vegetables	2(1+1)
TOTAL			10(5+5)



AGRICULTURAL EXTENSION

S. No	Course No	Department and Title of Course	Credits		
1	A11190*	Human Values & Ethics (nongradial)	1(1+0)**		
2	A11191	Rural Sociology & Educational Psychology	2(1+1)		
3	A13291	Fundamentals of Agricultural Extension	3(2+1)		
4	A14292	Entrepreneurship Development and Business Communication	2(1+1)		
5	A16391	Communication Skills and Personality Development	2(1+1)		
	TOTAL 1				

BIOCHEMISTRY AND BIOTECHNOLOGY

S. No	Course No	Department and Title of Course	Credits
1	A11101	Fundamentals of Plant Biochemistry and Biotechnology	3(2+1)
2	A15002	Principles of Food Science and Nutrition	2(2+0)
	5(4+1)		

ANIMAL PRODUCTION

S. No	Course No	Department and Title of Course	Credits	
1	A16050	Live-stock and Poultry Management	3(2+1)	
	TOTAL			

AGRICULTURAL MICROBIOLOGY

S. No	Course No	Department and Title of Course	Credits
1	A12010	Agricultural Microbiology	2(1+1)
		TOTAL	2(1+1)



STATISTICS AND COMPUTER APPLICATIONS

S. No	Course No	Department and Title of Course	Credits
1	A11020	Elementary Mathematics*	2(1+1)*
2	A11021	IT WORK SHOP	1(0+1)
3	A14022	Statistical Methods	2(1+1)
4	14024	Al and ML Applications in Agriculture	3 (2+1)
	6(3+3)		

ENGLISH

S. No	Course No	Department and Title of Course	Credits	
1	A11030	Comprehension & Communication Skills in English	2(1+1)	
	TOTAL			

PHYSICAL EDUCATION

S. No	Course No	Department and Title of Course	Credits
1	A11040	NSS/NCC/Physical Education & Yoga Practices**	0
2	A15041	Education Tour**	0
	0		

ELECTIVE COURSES AGRONOMY

S. No	Course No	Department and Title of Course	Credits
1	A15305	Agricultural Waste Management	3(2+1)



					ANUI
	2	A16306	Weed Management		3(2+1)
•		•	GENETICS AND PLANT BREEDING	•	
3		A16315	Commercial Plant Breeding	3(1-	+2)
		S	OIL SCIENCE AND AGRICULTURAL CHEMIS	TRY	
4		A14222	Soil, Plant,\Water and Seed Testing	3(1-	+2)

ENTOMOLOGY	
ticides and Bio fertilizers	

5	A15333	Bio pesticides and Bio fertilizers	3(2+1)
6	A16334	Agrochemicals	3(2+1)

AGRICULTURAL ECONOMICS

7	A15342	Agri business Management	3(2+1)
		PLANT PHYSIOLOGY	
8	A15362	Micro- propagationTechnologies	3(1+2)

PLANT PATHOLOGY

9	A14003	Food Safety Issues	3(2+1)
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HORTICULTURE

10	A14283	Hi-tech. Horticulture	3(2+1)
11	A15382	Landscaping	3(2+1)
12	A16383	Protected Cultivation	3(2+1)

STATISTICS AND COMPUTER APPLICATIONS

13	A14025	IOT applications in Agriculture	3(2+1)
14	A13023	PYTHON LANGAUGE	
17			3(2+1)
15	A15026	Drones and their applications in agriculture	3 (2+1)
TOTAL			39(23+1 6)



SEMESTER-WISE DISTRIBUTION OF COURSES ISEMESTER

	Course title	Credits
A11101	Agriculture Heritage*	1(1+0)*
A11102	Fundamentals of Agronomy	3(2+1)
A11001	Fundamentals of Plant Biochemistry and Biotechnology	3(2+1)
A11030	Comprehension and Communication Skills in English	2 (1+1)
A11020	Elementary Mathematics*	2(1+1)*
A11021	IT Work sop	1(0+1)
A11 111	Fundamentals of Genetics	3(2+1)
A11141	Fundamentals of Economics	3(3+0)
A11181	Fundamentals of Horticulture	2 (1+1)
A11190	Human Values and Ethics (non-gradial)	0
A11 191	Rural Sociology and Educational Psychology	0
A11040	NSS/NCC/Physical Education and Yoga Practices**	2 (0+2)** 22 (14+8)
	II SEMESTER	(*****)
	Course title	Credits
A12010	Agricultural Microbiology	2(1+1)
A12103	Introductory Agro meteorology and Climate Change	2 (1+1)
A12104	Introduction to Forestry	2 (1+1)
A12121	Fundamentals of Soil Science	3(2+1)
A12131	Fundamentals of Entomology I (Insect Morphology and Taxonomy)	3(2+1)
A12151	Soil and Water Conservation Engineering	2(1+1)
A12162	Fundamentals of Crop Physiology	3(2+1)
A12171	Fundamentals of Plant Pathology I	3(2+1)
A12182	(Plant Pathogens - An Introduction)	
	Production Technology of Fruits and Plantation Crops	2 (1+1)
		22 (13+9)



	III SEMESTER	UNIV
	Course title	Credits
A13201	Crop Production Technology I	3 (2+1)
	(Cereals, Millets and Pulses)	
A13211	Fundamentals of Plant Breeding	3 (2+1)
A13231	Fundamentals of Entomology II (Insect Ecology & Concepts of IPM)	2(1+1)
A13241	Agricultural Finance and Co-operation	2 (1+1)
A13251	Farm Machinery and Power	2 (1+1)
A13261	Eco-physiology	2(1+1)
A13 271	Fundamentals of Plant Pathology II (Plant Patholog Principles)	2(1+1)
A13281	Production Technology for Vegetables and Spices	2 (1+1)
A13 291	Fundamentals of Agricultural Extension	3(2+1)
A13023	Python language	3(2+1)
		24 (12+11/)
	IV SEMESTER	
	Course title	Credits
A14202	Crop Production Technology - II (Oilseeds, Fiber, Sugar, Tobacco and Fodder crops)	3 (2+1)
A14203	Farming Systems and Sustainable Agriculture	1 (1+0)
A14204	Irrigation Water Management	2 (1+1)
A14022	Statistical Methods	2(1+1)
A14024	Al and ML Applications in Agriculture	3 (2+1)
A14221	Manures, Fertilizers and Soil Fertility Management	3(2+1)
A14242	Agricultural Marketing, Trade and Prices	3 (2+1)
A14 252	Renewable Energy and Green Technology	2 (1+1)
A14282	Production Technology for Ornamental Crops, Medicinal and Aromatic Plants and Land scaping	2 (1+1)
A14292	Entrepreneurship Development and Business Communication	2(1+1)
A14 222/272/ 283/307/ 025	Elective Course	3credit



	23 (14+09)
	■ Habibi

3credit***

	V SEMESTER	
	Course title	Credits
A15301	Geo informatics and Nanotechnology for Precision Farming	2 (1+1)
A15302	Practical Crop Production	1 (0+1)
A15002	Principles of Food Science and Nutrition	2(2+0)
A15311	Crop Improvement-I (Cereals, Millets, Pulses And Oilseeds)	2 (1+1)
A15313	Intellectual Property Rights	1(1+0)
A15321	Problematic Soils and their Management	2(1+1)
A15331	Pests of Field crops and Stored Grain and their Management	3 (2+1)
A15351	Protected Cultivation and Post-harvest technologies	2 (1+1)
A15361	Environmental Studies and Disaster Management	2(1+1)
A15371	Diseases of Field and Horticultural Crops and their Management - I (Field Crops)	3 (2+1)
A15373	Principles of Integrated Pest and Disease Management	2(1+1)
A15 305/333/34 2/362/382/ 026	Elective Course	3 credit
		22(13+9)

3credit***

	VI SEMESTER	
	Course title	Credits
A16303	Rain fed Agriculture and Watershed	2(1+1)
	Management	
A16304	Principles of Organic Farming	2(1+1)
A16312	Crop Improvement-II (Fibre, Sugar, Starches, Narcotics, Vegetables, Fruits and Flowers)	2(1+1)



A16314	Principles of Seed Technology	3(2+1)
A16332	Pest of Horticultural Crops and their Management and Beneficial insects	3(2+1)
A16341	Farm Management, Production and Resource Economics	2(1+1)
A16372	Diseases of Field and Horticultural Crops and their Management - II (Horticultural Crops)	2(1+1)
A16381	Post-harvest Management and Value Addition of Fruits and Vegetables	2(1+1)
A16391	Communication Skills and Personality Development	2(1+1)
A16050	Live stock and poultry management	3 (2+1)
	Elective Course	3credits
		*Remedial
	Non gradial * Elective Courses	23 (13+10)

3credit***

	VII SEMESTER	
	Course title	Credits
RAWE	Rural Agricultural Work Experience (RAWE) and Agro Industrial Attachment (AIA)	
	Crop Production	5 (0+5)
	Crop Protection	4 (0+4)
	Rural Economics	3 (0+3)
	Extension Programme	4 (0+4)
	Research Station / KVK /DAATT Centre activities and attachment to Agro based industries	4 (0+4)
		20(0+20)
	VIII SEMESTER	
	Course title	Credits
AELP	Experiential Learning Programme (ELP)	20 (0+20)
		20 (0+20)



Elective Courses

Course No.	Courses	Credit Hours
A14222	Soil, Plant, Water and Seed Testing	3(1+2)
A14003	Food Safety Issues	3(2+1)
A14283	Hi-tech. Horticulture	3(2+1)
A15 305	Agricultural Waste Management	3(2+1)
A16306	Weed Management	3(2+1)
A16315	Commercial Plant Breeding	3(1+2)
A15333	Bio pesticides and Bio fertilizers	3(2+1)
A16334	Agrochemicals	3(2+1)
A15342	Agribusiness Management	3(2+1)
A15362	Micro propagation Technologies	3(1+2)
A15382	Landscaping	3(2+1)
A16383	Protected Cultivation	3(2+1)
A13023	Phython language	3 (2+1)
A14025	IOT Applications In Agriculture	3 (2+1)
A15026	Drones and their applications in agriculture	3(2+1)



Detailed syllabus and lecture outlines for first and second semester courses of first year beginning 2021-22 academic year

AGRONOMY First Year

A11101

AGRICULTURE HERITAGE

1(1+0)

Course outlines Theory

UNIT-1

Introduction to Indian agricultural heritage—Definition of heritage, agriculture heritage Need to study agriculture heritage. Genesis of agriculture and its chronological arrangement-Homes of evolution of agriculture and "old and new"world-Early indigenous domestications. Status of farmers in society and specific role of women in ensuring food security- Farming systems in ancient periods. Status of agriculture and advice by sages to kings on their duties towards farmers- Importance of farmers- Ancient agricultural practices and scientific basis.

UNIT-2

Soil management in ancient, medieval, pre-modern India –Historical background- Soil management and its relevance in pre-modern India and modern day sustainable agriculture. Use of amendments- Land management, Piercing, tillage, puddling and pre-plant submergence, mulching, fallowing. Soil concept- Ancient systems of soil classification- Ancient systems of soil management- Medieval and pre-modern soil management. Heritage of crop and water management— Ancient and pre-historic period; Medieval period.

UNIT-3

Plant growth and development- Heritage of plant protection through vrikshayurveda and traditional Knowledge. Plant protection in ancient India-Plant disorders—Cause, symptoms, treatment materials. Traditional knowledge in crop production and water management.

UNIT-4

Heritage of medicinal plants and their relevance today. Seed health in ancient and medieval history and its relevance to present day agriculture-seed health in Hellenistic age—seed health in India- Materials recommended for seed treatments. Description of



Indian civilization and agriculture by travellers from China, Europe and USA. UNIT- 5 Pre-historic cropping patterns. Our journey in agriculture- Green revolution and its impact and concerns. Vision for the future—Challenges ahead

References

- 1. ChoudaryS.L, Sharma,G.S, and Nene,Y.L(eds).2000.Ancient and Medieval History of Indian agriculture and its relevance to sustainable agriculture in the 21stcentury; Proceedings of the summer school held from 28 May to 17 June1999. Rajasthan college of Agriculture, Udaipur 313001.
- 2. Nene,Y.L(Ed). 2005. Agricultural Heritage of Asia proceedings of the international conference,6-8 December 2004, Asian-Agri history Foundation, Secunderabad-500 009, Andhra Pradesh, India.
- 3. Nene,Y.L.2007. Glimpses of Agricultural heritage of India. Asian-Agri-History Foundation,47–ICRISATColony-1 Brig sayeed Road, Secunderabad-500009 A.P India 901PPISBN-81-903963-0-7.

Course Code A11102 FUNDAMENTALS OF AGRONOMY Credits 3(2+1)

UNIT-1

Agriculture- Agronomy and its scope- Role of Agronomists in resource management for crop production. Tillage and tilth- Objectives of tillage- Characteristics of ideal seedbed-Effect of tillage on soil properties. Types of tillage-Factors affecting tillage and seedbed preparation-After cultivation-Puddling. Concepts of tillage-Minimum tillage, zero tillage, strip tillage, conservation tillage and their advantages and limitations. Seeds and sowing Characteristics of good quality of seed, seed treatment, agronomic significance of seed purity and quality- Methods of sowing, importance of time and depth of sowing. Crop density and geometry- Crop stand establishment, factors affecting optimum stand establishment. Plant population- Competition, types of competition, intra and inter plant competition- Effect of plant population on growth and yield, optimum plant density and planting pattern.

UNIT-2

Soil fertility and soil productivity— Soil organic matter and its importance- Loss of soil fertility and its maintenance. Crop nutrition—Essential plant nutrients- Primary, secondary and micronutrients— Nutrient uptake—Nutrient use efficiency. Manures and fertilizers. Types of manures and fertilizers- Factors influencing methods and time of fertilizer



application-Bio-fertilizers.

of weeds-Aquatic weeds.

ObjectivesofirrigationMethodsofirrigation and water use efficiency. Crop growth and development- Factors affecting growth and development- Agronomic manipulation of crop growth and development. Plant ideo types – Concept, definition-Morphological and physiological characteristics of new plant types. UNIT- 3 Cropping pattern, Cropping system-Crop rotation— Principles of crop rotation Mono cropping and its disadvantages— Types of cropping systems-Mixed, multiple, intercropping, relay and multi storied cropping. Crop adaptation and distribution in India and Andhra Pradesh- Factors influencing crop adaptation and distribution. Common problems in crop production related to climate, soil, pest and disease incidence- Crop management technologies to overcome the problems identified. Dry farming, dry land farming and rain fed farming— Classification of climate—Problems of crop production in dry areas. Soil moisture conservation and water harvesting measures—Watershed: Objectives and components — Watershed management. Weed—Definition—Importance-Harmful and beneficial effects

UNIT-4

Classification of weeds-Based on morphology, lifecycle, habitat, origin, association and special features with examples. Propagation of weeds—Sexual—Asexual-Vegetative (Rhizomes, rootstocks, runners, stolons, suckers, offsets, tubers, bulbs, bulbils, stems and roots). Weed biology-Characteristic features of weeds, weed ecology—Persistence of weeds, climatic, edaphic and biotic factors. Crop weed association—Factors affecting crop weed competition—Common weeds associated with major crops. Crop-weed-competition, Critical period of crop weed competition—Allelopathy. Methods of weed managementPrevention, control and eradication—Physical, mechanical and cultural methods—Chemical and biological methods of weed contro—Integrated weed management.

UNIT-5

Herbicides-Definition, advantages and limitations of herbicide usage in India.- Bio herbicides. Classification of herbicides based on chemical nature, time and method of application. Herbicidal formulations—active ingredient-Nomenclature of herbicides. Adjuvants and their use in herbicide application—Types of adjuvants with examples. Mode of action of herbicides-Important biochemical modes of action of herbicides. Selectivity and resistance- Selectivity of herbicides- Fundamental principles of selectivity-Differences in morphology and growth habit of plants-Differential absorption and translocation of herbicides. Harvesting and threshing of crops- Maturity symptoms of major crops- Time and methods of harvesting.



Practical

- 1. Visit to college farm and identification of major crops and varieties
- 2. Practice of primary tillage implements and puddling
- 3. Practice of secondary tillage implements
- 4. Practice of seeding equipment, inter cultivation implements
- 5. Seed germination and viability test-Study of sowing depth on germination and seedling vigour
- 6. Identification of manures, fertilizers and green manure crops/seeds.
- 7. Practice of manure and fertilizer application
- 8. Participation in ongoing field operations
- 9. Participation in ongoing field operations
- 10. Identification of weeds in field crops and other habitats
- 11. Study of weed flora in different weed management practices and calculation of herbicide efficiencies (WI & WCE)
- 12. Herbicide label information and computation of herbicide doses
- 13. Study of herbicide application equipment and calibration
- 14. Herbicide application and precautionary measures
- 15. Study of herbicide phyto toxicity symptoms in different crops
- 16. Identification of maturity symptoms of different crops

References

- 1. Reddy, S.R. 2016. Principles of Agronomy. Kalyani Publishers, Ludhiana-5 thedition
- 2. Yellamanda Reddy, T. and Sankara Reddi, G.H. (2016). Principles of Agronomy. Kalyani Publishers, Ludhiana.
- 3. Gopal Chandra de.1989. Fundamentals of Agronomy. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- 4. Gupta, O. P. 2011. Modern weed management. Agrobios (India), Jodhpur.



Course Code A11 111 FUNDAMENTALS OF GENETICS Credits 3(2+1)

UNIT-1

Pre Mendelian concepts of heredity–Early history of heredity, inheritance of acquired traits, preformation theory, pangenesis and germplasm theory. Chromosome-Structure of chromosome, types of chromosomes based on position of centromere. Cell division–Cell cycle– Mitosis-Process of mitosis-Significance. Meiosis – Process – Differences between mitosis and meiosis - Significance. Mendelian principles of heredity – Terminology, Mendel's experiments - Reasons for selection of pea as experimental material- characters studied - Reasons for mendel's success. Mendel's laws – Law of segregation – Law of independent assortment – Principle of dominance – Principle of unit characters – Exceptions to mendel's laws – Rediscovery of mendelian principles. Probability and Chi-square – Concept of probability, predicting results of a monohybrid cross, predicting results of a dihybrid cross - Chi-square test.

UNIT-2

Dominance relationships – Complete dominance, incomplete dominance, codominance, over dominance, pseudo domiance, lethal factors. Gene interaction – Non epistatic interaction – Interaction of factors; epistatic interactions – Complementary epistasis, dominant epistasis. Recessive epistasis, duplicate dominant gene action, dominant suppression or inhibitory gene action, duplicate genes with cumulative effect. Multiple alleles – Characteristics of multiple alleles – Blood groups in humans, coat colour in rabbits, self-incompatibility alleles in plants - pleiotropism, penetrance and expressivity. Linkage – Definition – Classification of linkage – Characteristic features of linkage –Linkage groups. Detection of linkage – Estimation of linkage – Importance of test cross in linkage studies – significance in plant breeding.

UNIT-3

Crossing over mechanisms – Mechanism of crossing over – Types of crossing over-Factors affecting crossing over. Significance of crossing over in plant breeding – Cytological proof of crossing over in Drosophila. Chromosome mapping – 2 – point and 3 – point test cross – Cytological maps and genetical maps – Coincidence and interference. Sex determination – Various mechanisms of sex determination – Chromosomal sex determination, genic balance mechanism of sex determination in Drosophila melanogaster, male haploidy, single gene effects etc. Sex linkage – White eye colour in Drosophila, colour blindness and haemophilia in humans-sex influenced traits – Horns in sheep, baldness in humans, sex limited - Milk production in cattle, beard in man – Pseudo hermaphrodites – Gynandromorphs. Qualitative and Quantitative traits, Polygenes and continuous variations – Definition-Inheritance and their differences, multiple factor hypothesis.



UNIT-4

Cytoplasmic inheritance – Definition – Chloroplast inheritance (leaf variegation in Mirabilis jalapa) – mitochondrial inheritance (cytoplasmic male sterility in maize) - Characteristic features of cytoplasmic inheritance - Differences between chromosomal and extra chromosomal inheritance. Nature and structure of genetic material – DNA and its structure – Watson and Crick'smodel – Function – Experiments to prove DNA as genetic material. Replication of DNA – Modes of DNA replication - Semi-conservative DNA replication Experimental proof. Types of RNA – Messenger RNA, ribosomal RNA and transfer RNA – structure of tRNA, dfferences between DNA and RNA. Protein synthesis – Central dogma, transcription and translational mechanism of genetic material – Genetic code – Properties of genetic code – Wobble hypothesis. Steps in protein synthesis – Transcription and translation. Gene regulation – Lac operon concept – Gene concept – Cistron – Recon – Muton.

UNIT-5

Mutation – Classification – Gene mutations – Introduction – Definition – Types of mutations – Spontaneous and induced mutations – Point mutations – Characters of mutations – Xenia and metaxenia – Chimeras Types and their significance in plant breeding. Methods of inducing mutations, Physical and chemical mutagens – Detection of sexlinked lethals in Drosophila (CIB method given by Muller). Molecular basis of mutations - Transitions, transversions and frame shift mutations. Importance of mutations in plant breeding. Structural changes in chromosome – Breakage – fusion – bridge cycle - Deletions(deficiency) – Duplications and their significance in plant breeding. Inversions – pericentric inversions and paracentric inversions – inversions as cross oversuppressors. Translocations – simple and reciprocal – their role in plant breeding.

Practical

- 1. Study of microscope.
- 2. Study of cell structure.
- 3. Practice on mitotic cell division.
- 4. Practice on meiotic cell division.
- 5. Practice on meiotic cell division.
- 6. Probability and Chi-square test.



- 7. Monohybrid and its modifications.
- 8. Dihybrid.
- 9. Trihybrid.
- 10. Testcross and backcross.
- 11. Epistatic interactions including testcross and backcross.
- 12. Epistatic interactions including testcross and backcross.
- 13. Epistatic interactions including test cross and backcross.
- 14. Determination of linkage and cross over analysis (through two point test cross data).
- 15. Determination of linkage and cross over analysis (through three point test cross data).
- 16. Study of models on DNA and RNA structure.

References

- 1. Pundhan Singh. 2006. Genetics. Kalyani Publishers, Ludhiana.
- 2. Singh, B.D. 2015. Fundamentals of Genetics. Kalyani Publishers, Ludhiana.
- 3. Gupta, P.K. 2007. Genetics. Rastogi Publications, Meerut.
- 4. Khanna, V.K. 2002. Genetics Numerical Problems. Kalyani publishers. 2 nd edition.
- 5. Pundhan Singh. 2011. Genetics at a Glance. Kalyani Publishers, Ludhiana.
- 6. Verma, P. S. and Agarwal, P. K. 2013. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology . S. Chand & Company Pvt. Ltd., Kolkata.
- 7. Snustad, D.P .and Simmons, M.J. 2010. Principles of Genetics. 5 th Ed.JohnWiley& Sons, 111, River Street, Hoboken, NJ, U.S.A.
- 8. Strickberger, M.W. 2006. Genetics. Prentice Hall of India Pvt. Ltd., New Delhi.



Course Code A11001 FUNDAMENTALS OF PLANT BIOCHEMISTRY AND BIOTECHNOLOGY Credits 3(2+1)

UNIT-1

Introduction – Historical aspects of Biochemistry– Scope, impact and importance of Biochemistry in plant sciences-Properties of water–PH–Buffers. Carbohydrates–Classification-Structures–Monosacharides–Structural aspects mutarotation - Reducing and oxidizing properties. Oligosaccharides and polysaccharides-Funtions of carbohydrates. Lipids–Fattyacids–Structures and properties–Functions of lipids. Lipids-Classification– Storage lipids and membrane lipids–Saponification,hydrogenation, lodine number and Acid value. Amino acids – Structures - Classification – Zwitterions – Titration. Peptides– Oligopeptides–Cyclic and acyclicpeptides–Malformin, Glutathione, Gramicidin – Functions of peptides.

UNIT-2

Proteins—Importance-Classification-Properties of proteins—Isoelectric PH— Denaturation - Protein sequencing —Edman degradation method. Proteins—Structural organization—Primary, secondary, tertiary and quaternary structures and forces involved in stabilizing proteins. Enzymes—Characteristics of enzymes—Chemical nature, speed, specificity, active site - activation energy — Mechanism of enzymeaction. Classification of enzymes—Isoenzymes—Multi enzyme complex—Allosteric enzymes and coenzymes. Measurement of enzyme activity—Factors effecting enzyme activity—Enzyme Inhibition — MM & LB plots. Nucleicacids—Functions—Structures of nitrogen bases—Nucleosides—Nucleotides inRNA and DNA.

UNIT-3

Various types of DNA and RNA–Secondary structure of B-DNA and t-RNA. Metabolism—Anabolism and Catabolism—Stages of respiration—Overall metabolic view of carbohydrates, proteins and lipids. Metabolism of carbohydrates—Glycolysis—Aerobic and anaerobic. Tricarboxylic Acid (TCA) cycle—Glyoxalate cycle—Electron transport chain 18Metabolism of lipids—Biosynthes is of fattyacids and triacylglycerol. Catabolism of lipids oxidation of fatty acids in brief and oxidation in detail. Protein Biosynthesis and post translational modifications.

UNIT-4

Secondary metabolites—Terpenoids—Alkaloids-Phenolics—Importance. Biotechnology—Major— Concepts and importance—Applications of plant biotechnology. Introduction to plant tissue culture—History—Scientists-Terminology—Steps in general tissue culture—



Types of sterilization and nutrient media—Types of cultures Organ cultures, cell suspension culture, callus culture, pollen culture and their applications. Micro propagation—Procedure techniques—Organo genesis and embryogenesis - Problems — Advantages —Limitations. Anther culture—embryo culture—Ovule culture—Somatic embryogenesis- Synthetic seeds and its applications. Protoplast isolation and fusion—Somatic hybridization—Cybrids— Soma clonal variations and applications in crop improvement—Cryo preservation.

UNIT-5

Recombinant DNA methods-Introduction to genetic engineering-Definitions-Genecloning - Vectors. Gene transfer methods-Indirect methods (Agrobacterium) and direct methods (physical-gene gun method; chemical-PEG mediated and other methods) with case studies /examples. Transgenic plants-Present status -Applications in crop improvement- Limitations -bio technology regulations. Polymerase chain reaction (PCR) -Procedure and applications. Markers-Morphological, biochemical and molecular markers-RFLP,RAPD and SSR -Marker assisted selection for crop improvement.

Practical

- 1. Preparation of solutions, pH and buffers.
- 2. Qualitative tests for carbohydrates.
- 3. Qualitative tests amino acids.
- 4. Estimation of amylose in rice.
- 5. Estimation of reducing sugar/Total soluble sugars.
- 6. Estimation of proteins by Lowrys method.
- 7. Extraction of oil from oil seeds by soxhletapparatus.
- 8. Effect of PH,temperature and substrate concentration on enzyme action.
- 9. Paper chromatography/TLC demonstration for separation of aminoacids.
- 10 Sterilization techniques.
- 11 Composition of various tissues culture media and preparation of stock solutions for MS nutrient medium.



- 12 Callus induction from various explants.
- 13 Micropropagation Hardening and acclimatization.
- 14 Demonstration of isolation of DNA and of gelelectrophoresis technique.
- 15 Demonstration of PCR Technique.
- 16 Demonstration of DNA fingerprinting-RAPD and Restriction digestion.

References:

- 1. David L. Nelson, Michael M.Cox; W.H. Freeman.LehningerPrinciples of Biochemistry, 6th Edition
- 2. Biochemistry, Dr. U. Satyanarayana, Dr. U. Chakrapani, Books and Allied (P) Ltd, Kolkata
- 3. Biochemistry, S.N. Gupta, Rastogi Publications, First Edition, 2011
- 4. Introduction to Plant Biotechnology by HSChawla(3rdEdition),Oxford&IBH Publishing Co. Pvt Ltd., NewDelhi



Course Code A11141 FUNDAMENTALS OF ECONOMICS Credits 3(3+0)

UNIT-1

Introduction to Economics – Economic activity and concept of economy and its functions, basic economic problems, three main economic actors-households, firms, governments as basic decision-making units. Economics - Meaning, definitions, its importance as a subject to science students. Scope of study of economics as a science -Subject matter of economics – Traditional approach – Consumption, production, exchange, distribution and public finance/ public policy - Modern Approach - Microeconomics and macroeconomics. Methods of economic investigation - Deduction and induction approaches, positive and normative analysis - Nature of economic theory - Rationality assumption, economic laws as generalization of human behaviour. Basic concepts: goods and services-Characteristics and classification, scarcity, choice, decision making, wants, substitutes and complements - Utility - Cardinal and ordinal approaches, forms of utility, marginal utility. Cost and price, value and wealth and their characteristics, capital, income, investment, welfare, efficiency, equilibrium and firm. Demand -Meaning, law of demand, demand schedule and demand curve characteristics, determinants, types of demand - Income demand, price demand, cross demand -Product demand, firm demand, market demand. Market dynamics due to changes/shifts in demand and prices - Contraction and extension, increase and decrease in demand. Law of diminishing marginal utility - Statement, assumptions of law, explanation, limitations of the law - Importance and applications. Law of equi-marginal utility -Meaning, assumptions, explanation of the law - Practical importance and applications, limitations.

UNIT-2

Consumer's surplus – Meaning, assumptions, explanation with examples, difficulties in measuring, consumer's surplus- Importance and applications-Engels law of family expenditure. Indifference curve analysis - Indifference curves - Meaning, basic assumptions, properties and their importance in economics. Budget line and its properties - Consumer's equilibrium - Graphical and algebraic expressions and its importance. Elasticity of demand – Meaning, elastic and inelastic demand, measurement of elasticity of demand - Types of elasticity of demand - Price elasticity, income elasticity and cross elasticity of demand. Kinds of elasticity of demand - Perfectly elastic, perfectly inelastic, relatively elastic, relatively inelastic, unitary elastic demand - Factors affecting elasticity of demand, practical importance of elasticity of demand. Production-Meaning of production process, creation of utility, factors of production and input - output relationship and production function – Meaning. Laws of returns-Increasing, decreasing and constant laws of returns-Meaning and explanation with examples. Cost-Seven production costs-Meaning and formulas, cost and output



relationships – Short run and long run cost curves. Supply – Meaning, definition, law of supply, supply schedule, supply curve and properties, determinants of supply - Market dynamics due to changes/shifts in supply and prices- Increase and decrease in supply, contraction and extension of supply.

UNIT-3

Elasticity of supply and its measurement- Kinds of elasticity of supply-Perfectly elastic, perfectly inelastic, relatively elastic, relatively inelastic and unitary elastic - Factors affecting elasticity of supply. Markets and market structure – Meaning, classification of markets based on market structure - Competition and its meaning, basic features of perfectly competitive and imperfect competitive markets. Characteristics of monopolistic competition, monopoly, duopoly, oligopoly, monopsony, duopsony and oligopsony with examples. Price determination under perfect competition - Equilibrium analysis -Numerical and graphical. Distribution theory - Meaning, factor market - Concepts of rent - Meaning, types of rent - Ricardian theory of rent. Wages - Meaning, nominal and real wages, working population in India - Labour participation rate, employment rate, unemployment rate - Interest- Meaning of interest and interest rate -Profit and income-Meaning, difference between income and profit. Pricing of factors of production -Modern theory of distribution. explanations. Public finance/ Public policy - Meaning, role and importance of public finance/Public policy - Functions of the government – Differences between public finance and private finance - Public revenue - Meaning, major and minor sources of public revenue. Tax - Meaning - Classification - Direct and indirect taxes, methods of taxation - Proportional, progressive, regressive and digressive taxation, agricultural taxation- VAT and GST.

UNIT - 4

Canons of taxation—Adam Smith's canons of taxation—Equality, economy, certainty and convenience — Other canons of taxation. Public expenditure—Meaning, need for public expenditure—Principles of public expenditure — Budget —Meaning -Balanced budget and deficit budget-Fiscal policy - Meaning and its policy instruments. National income accounting system—Meaning and importance, circular flow in the economy. Concepts of national income accounting - Gross domestic product, gross national product, net national product, net domestic product-National income at factor cost, personal income, disposable income, per capita income. Approaches to measurement of national income — Product method, income method, expenditure method and value-added method, difficulties in measurement. Trends in contribution of different sectors to GDP - Indian economy in the globalized world economy. Importance of population in the economy - Malthusian theory, escaping from the Malthusian stagnation- Innovations, technological



transition and economic growth. Money - Meaning, evolution of money, functions of money, the money market -Types of demand and supply of money in the economy. Credit - Meaning of credit, borrowing and lending, investments and their role in the modern economy - Credit controls and credit policy. Role of banking in the modern economy, functions of central bank and commercial banks, monetary policy and its instruments.

UNIT - 5

Types of inflation - Comprehensive and sporadic inflation – Suppressed and repressed inflation—Creeping, walking, running and galloping inflation—Markup inflation. General price index, wholesale price index, consumer price index-Rate of inflation – Measurement. Other causes of inflation—Remedial measures—Monetary and fiscal measures. Economic system - Meaning, importance of study of economy in systems approach -Types of economic systems. Capitalism-Meaning and its characteristic features, socialism and its characteristic features-Mixed economies and their characteristic features. Economic planning-Meaning, importance of planning in management of resources and institutions in the economy, elements of economic planning. Brief history of planning system in India Annual plans, five-year plans meaning and objectives, role of planning commission of India and NITI Ayog.

Reference

- 1. Dewett, K.K. and Varma, J.D. 2003. Elementary Economic Theory. S. Chand and Co., New Delhi.
- 2. Dewett, K. Kand Chand, A. 2009. Modern Economic Theory. S. Chand and Co., New Delhi.
- 3. Paul A. Samuelson and Nordhus. 2010. Economics.19 Edition, Tata- McGraw Hill Education, New Delhi.
- 4. Jhingan, M. L. 1990. Advanced Economic Theory. Vikas Publishing House, New Delhi
- 5. Koutsoyiannis. 2015. Modern Microeconomics. Tata Mac-Graw Hill Publishers, New Delhi
- 6. The Economy 2016, www.core-econ.org.



Course Code A11181 FUNDAMENTALS OF HORTICULTURE Credits 2(1+1)

UNIT-1

Horticulture–Definition-Divisions of horticulture with suitable examples. Scope and importance of horticulture- Importance of horticulture in terms of income, employment generation, industry, religious, aesthetic, food & nutritive value and export. Horticultural classification based on soil, climate and botanical classification. Climate and soil for horticultural crops- Influence of environmental factors on horticultural crop production—Temperature, humidity, wind, rainfall and solar radiation—Influence of soil factors—Soil type, pH, EC.

UNIT-2

Propagating structures- Plant propagation -Methods-Sexual and asexual— Propagation by cuttings— Definition of cutting—Stem cuttings—Leaf cuttings— Root cuttings. Propagation by Layering -Types of layering (tip, simple, compound, mound, trench, air layering)-Natural modifications of layering (runners, suckers, stolon, offset) - Propagation by separation -Bulbs, corms; division (rhizome, stem tuber, tuberous roots). Grafting, budding- Root stock and scion selection—Grafting methods— Attached scion methods of grafting, simple or approach grafting, detached scion methods of grafting (side grafting-Veneer grafting, apical grafting-epicotyl grafting, double, soft wood grafting, cleft grafting, tongue grafting, whip grafting)-Graft incompatibility—Types—Trans located and localized incompatibility; Budding—Methods of budding—T-budding, inverted T-budding, patch budding and ring budding—Top working.

UNIT-3

Principles of orchard establishment—Points to be kept in mind whiles electing site for the establishment of orchards - Principles and steps in orchard establishment-Layout of orchards— Systems of planting-Square, rectangle, quincunx, hexagonal and contour systems of planting-their merits and demerits. Principles and methods of training and pruning-Definition of training, objectives and training, principles and methods of training of fruit crops-Open centre, closed centre and modified leader systems their merits and demerits-Definition of pruning, objectives of pruning, principles and methods of pruning of fruit crops. Juvenility and flower bud differentiation—Methods for shortening juvenility-Application of growth regulators (Gibberellins, Auxins, cytokinins, Abscissic acid, Ethylene), environmental methods (photoperiod, temperature) - Cultivation techniques (grafting, pruning, girdling, irrigation, nutrition)-Bearing habits of fruit trees.

UNIT-4



Unfruitfulness, factors (physiological, phylogenical, management, parasitical, climatological) pollination-Self and Cross pollination, pollinizers and pollinators - Fertilization and parthenocarpy – Types. Types of vegetables Gardens–Kitchen Garden, market garden, truck garden, vegetable forcing, garden for processing, seed production garden and floating garden. Ornamental garden types–Formal–Informal–Wild Garden–Parts/ featuresof an ornamental garden. Lawn making– Selection of Grass–Bermuda grass–Korean grass–Poa grass– Fescue grass–Kentucky blue grassGrasses for shady areas–Site Selection–Soil -Preparation of soil–Drainage–Digging–Manuring and grading–Methods of planting–Sowing of seeds–Dibbling–Turfing–Maintenance of lawn–Mowing– Rolling – Sweeping –Scraping – Raking – Weeding – Irrigation – Top dressing with compost and fertilizers-Diseases and other problems–Fairy ring–Pale Yellow Laws.

UNIT-5

Use of plant bio-regulators (PBR) in horticulture—Introduction—Applications of PBR in fruit crops. Irrigation methods in horticulture crops-Different methods followed in horticultural crops (check basin, furrow, ring basin, basin, flood, pitcher, funnel, drip and sprinkler). Fertilizer application, Different methods of application to horticultural crops-Broad casting, top dressing, localized placement, contact placement Band placement, row placement, pellet, foliar application, starter solution, fertigation.

Practical

- 1. Identification of garden tools.
- 2. Identification of horticultural crops.
- 3. Layout of different planting systems.
- 4. Layout of kitchen garden.
- 5. Preparation of nursery bed (raised and flat beds) and sowing of seeds.
- 6. Practice of different asexual methods by divisions.
- 7. Practice of different asexual methods by cuttings.
- 8. Practice of different asexual methods by grafting.
- 9. Practice of different asexual methods by budding.
- 10. Practice of different asexual methods by layering.
- 11. Training and pruning of fruit trees.
- 12. Transplanting and care of vegetable seedlings.



- 13. Making of herbaceous and shrubbery borders.
- 14. Preparation of potting mixture, potting and repotting.
- 15. Fertilizer application in different crops.
- 16. Visits to commercial nurseries/orchard.

- 1. Chadha, K.L.2001. Handbook of Horticulture. ICAR, New Delhi.
- 2. Jitendra Singh, 2012. Basic Horticulture. Kalyani Publishers. New Delhi.
- 3. Randhawa, G.S. and Mukhopadhyaya, A. 1994. Floriculture in India. Allied Publishers Pvt. Ltd., New Delhi
- 4. Kumar, N. 1997. Introduction to Horticulture. Rajyalakshmi Publications, Nagorcoil, Tamilnadu.



Course Code A11190 HUMAN VALUES AND ETHICS* Credits 1(1+0)

UNIT-1

Universal human aspirations, happiness and prosperity. Human values and ethics-Concept, definition, significance and sources-Fundamental Values-Right conduct, peace, truth, love and non-violence. Principles and philosophy—Self exploration, self-awareness, self-satisfaction, decision making, motivation, sensitivity, success, selfless service. Case study of ethical lives.

UNIT-2

Positive spirit, body, mind and soul-Attachment and detachment. Spirituality and spirituality quotient. Examinations.

UNIT-3

Ethics-Professional, environmental, ICT-Sensitization towards others particularly senior citizens, developmentally challenged and gender. Positive attitude and scientific temper. Team work and volunteering.

UNIT-4

Rights and responsibilities. Road safety. Human relations and family harmony, modern challenges and value conflict.

UNIT-5

Sensitization against drug abuse and other social evils. Developing personal code of conduct (SWOT/SWOC/SNAC Analysis). Management of anger and stress.

- 1. Gaur RR, Sangal R and BagariaGP.2011. A Foundation Course in Human Values and Professional Ethics. Excel Books.
- 2. Mathur SS.2010. Education for Values, Environment and Human Rights. RSA International.
- 3. Sharma RA.2011.HumanValuesandEducation—Axiology, Inculcation and Research. R. Lall Book Depot.
- 4. Sharma RP and Sharma M. 2011. Value Education and Professional Ethics. Kanishka Publishers.
- 5. Srivastava S. 2011. Human Values and Professional Ethics. SK Kataria and Sons.



- 6. Srivastava S. 2011. Environmental Science. SK Kataria & Sons.
- 7. Tripathi A.N. 2009. Human Values. New Age International(P) Ltd Publishers.
- 8. R.S. Nagarajan. Text Book on Professional Ethics & Human Values.
- 9. D.R. Kiran. Professional Ethics & Human Values
- 10. Virendra Kumar. Human Values and Professional Ethics.
- 11. M. Govindarajan. Engineering Ethics.



Course Code A11191 RURAL SOCIOLOGY AND Credits 2 (1+1) EDUCATIONAL PSYCHOLOGY

UNIT-1

Sociology and Rural Sociology- Meaning, definition, scope, its significance in Agricultural Extension- Importance of Rural Sociology in Agricultural Extension and their interrelationship. Indian rural society- Characteristics, differences and relationship between rural and urban society. Social group(s) – Meaning, definition, classification, factors to be considered in formation of groups-Role of social groups in Agricultural Extension. Social Stratification– Meaning, definition, bases and forms of social stratification, characteristics and differences between class system and caste system.

UNIT- 2

Different cultural concepts- Culture, tradition, customs, folkways, mores, taboos, ritual Definition, meaning, concept and examples and their role in Agricultural Extension. Social values- Meaning, definition and types; social control- Meaning, definition, need of social control and means of social control and attitudes- Types and their role in Agricultural Extension. Social institution— Types— Family, education, religious, economic (Cooperative society) & political (Panchayat)- Characteristics, functions and their importance/ role in Agricultural Extension.

UNIT-3

Social change- Meaning, definition, nature of social change, dimensions of social change and factors of social change & development. Psychology and educational psychology Meaning, definition, scope and its importance in Agricultural Extension— Behavior-Cognitive, affective and psychomotor domains. Intelligence-Meaning, types, factors and importance in Agricultural Extension.

UNIT-4

Perception-Meaning, types, factors and importance in Agricultural Extension. Emotions and frustration-Meaning, types, factors and importance in Agricultural Extension. Personality Meaning, definition, types, factors influencing personality and importance in Agricultural Extension.

UNIT-5

Motivation-Meaning, types of motives, theories of motivation and importance of motivation in Agricultural Extension. Teaching, learning, learning experience, learning situation Meaning and definition, elements of learning situation and its characteristics. Principles of learning, their implications in teaching and steps in extension teaching.



Practical

- 1. Visit to village to study the characteristics of rural society and rural stratification.
- 2. Visit to village to study the social groups.
- 3. Visit to village to study the village institution –School.
- 4. Visit to village to study the village institution—Cooperative society/ Bank.
- 5. Visit to village to study the village institution—Gram Panchayat.
- 6. Visit to village to study the social organization-Youth Club/ Rytu Mitra group.
- 7. Visit to village to study the social organization-Milk Co-operative centre/ Dairy unit.
- 8. Visit to village to study the social organization- Water User Association/ Self Help Group.
- 9&10 Visit to a village to list out the customs- Folkways, mores, taboos, rituals and social values- Simulated exercises on perception of students.
- 11. Simulated exercises for positive and negative emotions of students.
- 12. Nature of learners behavior in motivation.
- 13. &14. Administering psychological tests to assess personality types of human beings.

Experiment:

- 1) Eysenk personality inventory Administering psychological tests to assess personality types of humanbeings. 2) Edward'spersonality inventory.
- 15. To study the types of intelligence among students.
- 16. Creating a learning situation under village conditions with a selected technology.

- 1. Adivi Reddy, A. 2006. Extension Education. Sree Lakshmi Press, Bapatla
- 2. Chitamber, J. B. 1997. Introductory Rural Sociology. Wiley Eastern Limited, New Delhi
- 3. Daivadeenam, P. 2006. Educational Psychology in Agriculture. Agrotech Publishing Academy, Udaipur



- 4. Mangal, S. K. 2000. Educational Psychology. Prakash Brothers, Ludhiana.
- 5. Ray, G.L. 2006. Extension Communication and Management. Naya Prokash/ Kalyani Publishers, Ludhiana
- 6. Vidya Bhushan and Sach Dev.D.R. 1998. An Introduction to Rural Sociology. Kitab Mahal Agencies Allahabad.

Course Code A11020 ELEMENTARY MATHEMATICS Credits 2(1+1)

UNIT-1

Definition of matrices, order of a matrix- Type of matrices-Addition-Subtraction-Multiplication - Transpose of matrix -Minor. Define Co-factor of matrix - A Inverse matrix upto 3rd determinants and properties of determinants up tp 3 rule and order and their evaluation - Cramer's simple problems based on it. Definition of function - Limit and continuity with simple problems. Differentiation of xn -ex -sin x and cos x by first principle - Derivatives of sum - Difference product and quotient of two functions - Differentiation of functions of functions (Simple problems based on it).

UNIT- 2

Logarithmic differentiation (simple problems based on it) - Differentiation by substitution simple problems) - Differentiation of inverse trigonometric functions - Equations of tangent- Normal of given curve at given point. Define Maxima and Minima with simple problems. Integration of functions - Integration of product of two functions - Integration by substitution method.

UNIT-3

Definite Integral (simple problems based on it) – Area under simple well- known curves (simple problems based on it). Introduction to Co-ordinate geometry and give distance formula – Section formula with examples. Define straight line and write different types of straight line forms with examples. Solve the angles between two straight lines – Area of triangle and quadrilateral.

UNIT-4

Definition of standard and general equation of circle – Equation of circle passing through three given points. Tangent and normal to a given circle at given point (simple problems)



- Condition of tangency of a line to circle. Definition of general and standards equations of parabola-Vertex Focus-Equation of directrix - Length of lotus rectum.

UNIT-5

Equation of tangent and normal to a given point (simple problems)- Conditions of tangency of line y=mx+ctoy2=4ax. Define standard form of the ellipse. Focus–Directrix-Vertex of the ellipse in both cases (a>b, b>a). Equation of tangent-Normal at given points to a given ellipse with problems.

Practical

- 1. Problems on Addition-Subtraction-Multiplication-Transpose of matrix 3rd order.
- 2. Problems on minor-Co-factor of matrix-Inverse of matrix upto3rdorder.
- 3. Cramer's rule and simple problems based on it and problems on determinants.
- 4. Function limit and continuity with simple problems.
- 5. Problems on differentiation of x n-e x- sinx and cosx by first principle.
- 6. Derivatives of sum difference product and quotient of two functions Differentiation of functions Simple problems based on it.
- 7. Logarithmic-Inverse-Trigonometric functions Functions of functions Equations of tangent- Normal of given curve at given point- Simple problems.
- 8. Problems on integration of functions Integration of product of two functions Integration by substitution method.
- 9. Integral (simple problems based on it)- Area under simple well –known curves (simple problems based on it).
- 10. Problems on different types of straight line forms.
- 11. Problems on angles between two straight lines Area of triangle and quadrilateral. 12. Problems on equation of circle passing through three given points.
- 13. Problems on parabola–Vertex–Focus-equation of directrix-Length of lotus rectum. 14. Problems on equation of tangent and normal to a given point-Conditions of tangency of line y = mx + ctoy2 = 4ax
- 15. Problems on standard form of the ellipse-Focus–Directrix-Vertex of the ellipse in both cases (a>b, b>a).
- 16. Equation of tangent –Normal at given points to a given ellipse-Simple problems.

- 1. MVSLDN Raju and Dr. K. V. Ramana— EngineeringMathematics-1
- 2. MVSLDN Raju and Dr. K. V. Ramana- EngineeringMathematics-2
- 3. Text Book for A.P Intermediate Mathematics—Paper (IA&IIB).
- 4. MVSLDN Raju and K. V. Ramana Agricultural Mathematics.



Course Code A11021 IT WORKSHOP Credits 1(0+1)

Week 1:

Task 1: Identify the peripherals of a computer, components in a System Cabinet and its functions. Draw the block diagram of the computer mother board along with the configuration of each peripheral and submit to your instructor.

Week 2:

Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Week 3:

Task 3: Every student should individually install Operating System on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Week 4:

Task 4: Every student should configure dual boot system. Lab instructors should verify the installation and follow it up with a Viva

Week 5:

Task 5: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email.

Week 6:

Task 6: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Week 7 and Week 8:

Task 7: Features of Word Processor Tool: Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track changes.

Task 8: Creating a Newsletter: Features: Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge.



Week 9 and Week 10:

Task 9: Features of Spread sheet Tool: Creating a Scheduler - Features:- Gridlines, Format Cells, Summation, auto fill, Formatting Text

Task 10: Calculating GPA: Cell Referencing, Formulae in spread sheet – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, lookup, Sorting, Conditional formatting.

Week 11 and Week 12:

Task 11: Features of Presentation tool: Students will work on basic power point utilities and tools which help them to create power point presentation.

Task 12: Presentation Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Hyperlinks, Inserting – Images, Clip Art, Audio, Video, Objects, Tables and Charts Lines and Arrows

Week 13: Document preparation using LaTex

Week 14 and Week 15: Review of Previous tasks Note: Document, Spread Sheet and Presentation Tools, are from Libre Office suite

REFERENCES:

- 1. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dream tech
- 2. The Complete Computer upgrade and repair book,3rd edition Cheryl A Schmidt, WILEY Dreamtech
- 3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
- 4. PC Hardware and A+Handbook Kate J. Chase PHI (Microsoft)
- 5. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken Quamme. CISCO Press, Pearson Education.
- 6. IT Essentials PC Hardware and Software Labs and Study Guide Third Edition by Patrick Regan CISCO Press, Pearson Education.

Course Code A11030 Credits 2(1+1) COMPREHENSION ANDCOMMUNICATIONSKILLS IN ENGLISH UNIT- 1



War minus shooting—A lesson from the text book "The Sporting Spirit" by George Orwell-Comprehension pertaining to the textual grammar- Fill in the blanks, matching and vocabulary. Synonyms- List of synonyms – Choose the synonyms- Exercises-Practice and implementation. Antonyms— Fill in the blanks Choose the correct antonyms- Exercises Practice and implementation. Verbal ability— A list of words of ten confused and misused- Practice and implementation.

UNIT-2

A Dilemma–A lesson from the textbook, "Layman looks at Science" by Raymond B. Fosdick - Comprehension pertaining to the textual Grammar - Fill in the blanks, matching, vocabulary and reading comprehension. A Dilemma– A Layman looks at Science- Reading comprehension and answering the questions. Homonyms – Homonyms are distinct words with quite different meanings using the words in two ways – More words at a glance and exercises related to GRE and TOEFL.

UNIT-3

Homophones— A list of homophones- Fill in the blanks, underline the correct word and exercises related to GRE and TOEFL. You and Your English— A lesson from the textbook, "A Spoken English and Broken English "by G. B. Shaw — Answering the questions related to the text — Fill in the blanks, matching and vocabulary and reading comprehension. You and Your English—Reading comprehension and answering the questions.

UNIT-4

Functional Grammar— Tenses — Active voice and passive voice — Degrees of comparison and types of sentences — Direct and indirect speech and agreement of verb with subject functional grammar — Articles — Prepositions- Parts of speech and agreement verb with subject -Glossary. Business correspondence Principles of letter — Writing - Courtesy and consideration- Directness and conciseness, avoid—Verbosity and participial endings- Clarity and precision- Negative and roundabout-Structure and layout Of letters Planning a letter quotation, orders, tenders, sales letters, claim and adjustment letters, job application letters Social correspondence—Personal correspondence and curriculum vitae. The style- Importance of professional writing- Choice of words and phrases, clichés - Jargons - Foreign words and phrases.

UNIT-5

Precise writing- Summarizing— The essential features of a good precise— Important points while making a precise- Some don'ts- Make a precise of the following paragraph and suggest suitable title- Figurative language—Figurative language associated with literature and with poetry- The figures of speech usually used in writing and conversation. Interviews— The screening interview- The informational interview- The directive style- The meandering style- The stress interview-The behavioral interview- The audition- The Tag Team interview- The mealtime interview-



The follow— up interview- Fermi interview- Preparing for the interview- Body language and interview-Types of interview questions- Idiomatic language.

Practical

- 1. Effective listening– Developing listening skills–Honing listening skills.
- 2. Listening to short talks and lectures from the cassettes of EFL University.
- 3. Spoken english- Vowels-Consonants- Monophthongs, diphthongs, triphthongs.
- 4. Stress Intonation Phonetic transcription.
- 5. Seminars–Conferences-Preparation and demonstration.
- 6. Oral presentation by students- Articulation and delivery–Evaluation sheet for oral presentation.
- 7. Communication skills—Verbal communication- Written communication.
- 8. Telephonic conversation.
- 9. Reading skills- Skimming, scanning- Extensive reading- Intensive reading and examples.
- 10. Meeting- Purpose, procedure, participation, physical arrangements.
- 11. Presentation of reports by using PowerPoint and L.C.D.
- 12. Interviews Mock interviews.
- 13. Debate and Group discussion.
- 14. Using a dictionary effectively.
- 15. Vocabulary.
- 16. Pronunciation practice.

References

- 1. Balasubramanian, T. 1989. A Text Book of Phonetics for Indian Student, Orient Longman, New Delhi.
- 2. Balasubramanyam, M. 1985. Business Communication. Vani Education Books, New Delhi.
- 3. Jean Naterop, B. and Rod Revell. 1977. Telephoning in English. Cambridge University Press, Cambridge.
- 4. Krishna Mohan and Meera Banerjee. 1990. Developing Communication Skills.Mc Millan India Ltd. New Delhi.
- 5. Krishanswamy, Nand Sriraman, T. 1985. Current English for Colleges. McMillan India Ltd., Madras.
- 6. Narayanaswamy VR. 1979. Strengthen Your Writing. Orient Longman, New Delhi.
- 7. Sharma RC and Krishna Mohan. 1978. Business Correspondence. Tata McGraw Hill Publishing Company, New Delhi.

Course Code A11040** NSS / NCC / PHYSICAL EDUCATION &YOGA PRACTICES** Credits 2(0+2)
UNIT- 1



Introduction and basic components of NSS - Orientation - History, objectives, principles, symbol, badge; regular programs under NSS, organizational structure of NSS, code of conduct for NSS volunteers, points to be considered by NSS volunteers awareness about health. NSS programmes and activities - Concept of regular activities, special camping, day camps, basis of adoption of village / slums, conducting survey, analysing guiding financial patterns of scheme, youth programme / schemes of GOI, coordination with different agencies and maintenance of diary. Understanding youth - Definition, profile, profile, categories, issues and challenges of youth; and opportunities for youth who is agent of the social change. Community mobilization - Mapping of community stake holders, designing the message as per problems and their culture; identifying methods of mobilisation involving youth - adult partnership. Social harmony and national integration - Indian history and culture, role of youth innation building, conflict resolution and peace-building. Volunteerism and shramdan- Indian tradition of volunteerism, its need, importance, motivation and constraints; shramdan as part of volunteerism. Citizenship, constitution and human rights - Basic features of constitution of India, fundamental rights and duties, human rights, consumer awareness and rights and rights to information.

UNIT-2

Family and society - Concept of family, community (PRI s and other community based organisations) and society. Importance and role of youth leadership -Meaning, types and traits of leadership, qualities of good leaders; importance and roles of youth leadership. Life competencies - Definition and importance of life competencies. problemsolving and decision - making, inter personal communication. Youth development programmes Development of youth programmes and policy at the national level, state level and voluntary sector; youth - focused and youth - led originations. Health, hygiene and sanitation - Definition needs and scope of health education; role of food, nutrition, safe drinking water, water borne diseases and sanitation (Swachh Bharat Abhiyan) for health; national health programmes and reproductive health. Youth health, life style, HIV AIDS and first aid - Healthy life styles, HIV AIDS, drugs and substance abuse, home nursing and first aid.

UNIT-3

Youth and yoga - History, philosophy, concept, myths and mis conceptions about Yoga; yoga traditions and its impacts, yogaas a tool for healthy life style, preventive and curative method Vocational skill development - To enhance the employment potential and to setup small business enterprises skills of volunteers, A list of 12 to15 vocational skills will be drawn up based on the local conditions and opportunities. Each volunteer will have the option to select two skill-areas out of this list. Issues related environment - Environmental conservation, enrichment and sustainability, climatic change, natural resource management (rain water harvesting, energy



conservation, forestation, waste land development and soil conservations) and waste management. Disaster management - Introduction and classification of disaster, rehabilitation and management after disaster; role of NSS volunteers in disaster management.

UNIT-4

Entrepreneurship development - Definition, meaning and quality of entrepreneur; steps in opening of an enterprise and role of financial and support service institution Formulation of production oriented project - Planning, implementation, management and impact assessment of project Documentation and data reporting Collection and analysis of data, documentation and dissemination of project reports Youth and crime-Sociological and psychological factors influencing youth crime, Cyber - crime, pear mentoring in preventing crime and awareness for juvenile justice Civil / self defence - Civil defence services, aims and objectives of civil defence; Needs and training of self defence.

UNIT-5

Resource mobilisation - Writing a project proposal of self -fund units (SFUs) and its establishments Additional life skills - Positive thinking, self -confidence and esteem, setting life Goals and working to achieve them, management of stress including time Management. I year B.Sc. (Hons) Agriculture –II Semester



Course Code A12103 INTRODUCTORY AGRO METEOROLOGY Credits2 (1+1) AND CLIMATE CHANGE

UNIT-1

Introduction: The three spheres of the earth; Terminology and definitions: Meteorology, Climatology, Agro meteorology, Agro climatology climate and weather. Scope and importance of agro meteorology. Agroclimatic regions of India and Agro climatic zones of Andhra Pradesh. Atmosphere - Composition of the atmosphere - Weather elements - Extent and structure of the atmosphere. Solar Radiation: Nature and properties of solar radiation Conduction – Convection- Radiation - Solar Spectrum - Distribution of solar radiation within the crop canopies - Physiological response of different bands of incident radiation - Definitions of solar constant, net radiation, albedo - Solar radiation and crops.

UNIT-2

Temperature: Temperature and heat, definitions - Temperature inversion - Adiabatic lapse rate - Daily and seasonal variations of temperature - Vertical profile of temperature - Energy balance of earth. Low air temperature and plant injury and high air temperature and plant injury - Soil temperature - Factors affecting soil temperature - Temperature and crops. Humidity: Concept of saturation - Vapour pressure - Types of humidity - Humidity and crops- Atmospheric Pressure: Definitions of pressure, atmospheric pressure, standard atmospheric pressure.

UNIT-3

Wind: Types of wind; Planetary winds (trade winds, westerlies, polar easterlies, cyclones and anti cyclones) periodic winds and local winds (sea and land breezes, mountain and valley winds) Daily and seasonal variation of winds - Effect of wind on crops. Precipitation: Process of precipitation, types of rainfall (orographic, convectional and cyclonic) - Definition of cloud – WMO classification of clouds. Forms of precipitation (solid, liquid and mixed) and condensation (dew, fog, mist, frost, cloud) - Artificial rain making - Monsoon: Indian monsoons, SW monsoon & NE monsoon.

UNIT-4

Importance of monsoon in Indian agriculture - date of onset, significant features of Indian monsoon; length of growing season. Weather hazards: Drought - Floods - Cyclones - Heat and cold - waves and their management. Weather Forecasting: Importance - Types of weather forecast and their uses - Synoptic charts - Remote sensing - Applications of remote sensing in agriculture- Agro meteorological Advisory services in India.

UNIT-5

Climate change - variability - Global processes and effects - Greenhouse effect - Temperature changes on the earth - Precipitation changes on the earth - Changes in extreme events - Sea level raising - Tracking climate change - Impacts of climate



change on agriculture - Climate neutral. Summary of evidence for climate change - Basic models for evaluating climate change Impacts- Specific weather related effects due to climate change. Micro climate - micro climate scales – Modifications of crop micro climate - Examples of manipulation of climate - Climatic normals for crop and livestock production.

Practical

- 1. Visit to Agro meteorological Observatory, site selection and layout plan for observatory.
- 2. Exposure to agro meteorological instruments and weather data recording.
- 3. Measurement of total, shortwave and long wave radiation and its estimation by using Planck's intensity law.
- 4. Measurement of albedo and sunshine duration.
- 5. Computation of radiation intensity using bright sun shine hours.
- 6. Measurement of maximum and minimum air temperatures.
- 7. Measurement of soil temperature and computation of soil heat flux.
- 8. Determination of atmospheric pressure and vapour pressure.
- 9. Determination of relative humidity.
- 10. Determination of dew point temperature.
- 11. Measurement of wind speed and wind direction.
- 12. Measurement, tabulation and analysis of rainfall data.
- 13. Measurement of open pan evaporation and evapo-transpiration. Computation of PET and AET
- 14. Preparation of synoptic chart and report
- 15. Computation of climate change and variability
- 16. GDD, HTU and PTU calculations and their interpretation using their efficiencies

- 1. Radha Krishna Murthy, V.2016. Principles and practices of agricultural disaster management. B.S Publications, Koti, Hyderabad.
- 2. Reddy, S.R.2014. Introduction to Agriculture and Agro meteorology. Kalyani Publishers, Ludhiana, Punjab.
- 3. Radha Krishna Murthy, V. 2002. Basic Principles of Agricultural meteorology .BPublications, Koti, Hyderabad.



INTRODUCTION TO FORESTRY Course Code A12104 Credits 2(1+1) UNIT- 1

Introduction—definitions of basic terms related to forestry, Indian forest, target area, productivity Influence of forest on climate, soil, floods, erosion, human health and recreation. Objectives of silviculture, forest classification, salient features of Indian forest policies. Forest regeneration, Naturals regeneration- natural regeneration from seed and vegetative parts, coppicing, pollarding, root suckers.

UNIT-2

Artificial regeneration –objectives, choice between natural and artificial regeneration, planting methods, essential preliminary considerations. Crown classification. Tending operations—weeding, cleaning, thinning—mechanical, ordinary, crown and advance thinning. Principles and practices of social forestry nurseries- types of nurseries- success in nursery production.

UNIT-3

Afforestation in different sites- shiftings and dunes, saline soils, ravine and, wet lands, lateritic soils, dry rocky soils, canal banks, road sides and watershed areas. Village wood lots, selection of species – measures for shortage of fuelwood-Properties of fuel wood – management and advantages of energy plantations-Suitable trees pecies. Forest mensuration-objectives, diameter measurement, instruments used in diameter measurement; Non instrumental methods of height measurement- shadow and single pole method.

UNIT-4

Instrumental methods of height measurement – geometric and trigonometric principles, instruments used in height measurement. Tree stem form, form factor, form quotient, measurement of volume of felled and standing trees, age determination of trees. Major and minor forest products.

UNIT-5

Agroforestry–definitions, importance, criteria of selection of trees in agroforestry. Different agroforestry systems prevalent in the country, shifting cultivation, taungya, alley cropping, wind breaks and shelter belts, home gardens. Cultivation practices of Subabul, Eucalyptus and Casuarina tree species.

Practical

- 1. Identification of tree-species.
- 2. Diameter measurements of trees
- 3. Height measurement of standing trees
- 4. Volume measurement of trees
- 5. Biomass estimation in energy plantations
- 6. Nursery lay out, seed sowing,
- 7. Application of pre-sowing seed treatments



- 8. Vegetative propagation techniques.
- 9. Field planting techniques
- 10. Forest plantations and their management.
- 11. Identification of important major and minor forest products
- 12. Visits of nearby forest based industries.
- 13. Visit to social nurseries of forest department
- 14. Visit to energy plantations and forest research centres.
- 15. Visitsto nearby forest based industries.
- 16. Collection and maintenance of forest products and herbarium.

- 1. Dwivedi, A.P.1980.Forestry in India, Jugal Kishore and Company, DehraDun
- 2. Negi, S.S.1999. Agroforestry hand book, International book distributor, DehraDun.
- 3. Ram Prakash and Drake Hocking. 1986. Some favourite trees for fuel and fodder, International book distributor, Dehradun.
- 4. Singh, S.P.2009. Tree farming-. Agrotech Publishing academy, Udaipur.
- 5. Singh, S.P.2010. FavouriteAgro forestry trees, Agrotech Publishing academy, Udaipur.
- 6. Troup, T.S.1986.Silviculture of Indian trees(Vol.II&III)-International book distributor, Dehradun.



Course CodeA12121 FUNDAMENTALS OF SOIL SCIENCE Credits 3(2+1) UNIT- 1

Introduction- Spheres of the earth atmosphere, hydrosphere and lithosphere— Their characteristics—Origin of soil—Soil and soil components—Mineral matter, organic matter, water and air—Definition of soil and various concepts of soil—Branches of soil science. Rocks—Classification of rocks based on mode of origin— Igneous rocks, sedimentary rocks and metamorphic rocks— Classification of rocks based on silica content—Weather ability of rocks. Minerals—Primary, secondary, essential and accessory minerals—Primary minerals. Quartz, feldspar, micas, pyroxenes, amphiboles and olivines—Weather ability of primary minerals. Non-silicate minerals—P, Ca, Mg, S and micronutrient containing minerals—Secondary silicate minerals—Basic structural units. Weathering—Types of weathering—Physical weathering of rocks—Agents of physical weathering and their role-Biological weathering—Role of flora and fauna in weathering process. Chemical weathering—Solution, hydration, hydrolysis, carbonation, oxidation and reduction.

UNIT-2

Parent material—Classification of parent materials based on their mode of transport by different agents- Soil formation— Soil forming factors— Classification and their role in soil formation— Catena—Definition. Pedogenic processes—Eluviation, illuviation, humification, calcification, laterization, podzolisation, melanisation, salinization and alkalization. Soil profile—Detailed description of a theoretical soil profile—Differences between surface soil and subsoil. Soil physical properties—Soil texture—Definition—Various in organic components in soil and their properties—Various textural classes in soil and their properties. Particle size analysis—Stoke's Law—Assumptions and limitations—significance of soil texture. Soil consistence—Consistence of wet and dry soils—Soil crusting—Soil plasticity—Atterberg's plastic limits—Factors affecting plastic limits—Significance of soil consistence.

UNIT-3

Soil structure—Classification—Types, classes and grades of soil structure—Importance of soil structure and its management. Soil density—Bulk density and particle density—Factors affecting density parameters—Importance of bulk density of soil—Soil compaction—its importance. Calculation of porosity. Soil strength and its importance—Soil colour—Components—Significance of soil colour. Soil water—Forces of soil water retention—pF concept—Soil moisture characteristic curves—Importance of soil water. Soil water potential—Components of water potentials—Soil moisture constants—Field capacity, wilting coefficient, hygroscopic water and saturation—Available water andmethods for determining soil moisture constants—Pressure plate and pressure membrane apparatus. Soil water content—Soil water movement—Darcy's Law—Saturated, unsaturated and vapour flows—Infiltration, percolation and



permeability— Distribution of water in profile in different soils—Soil drainage and its importance.

UNIT-4

Soil temperature— Sources of heat—Heat capacity and conductivity—factors influencing soil temperature—Modification of soil thermal regimes—Measurement of soil temperature—Importance of soil temperature on crop growth—Management of soil temperature and importance. Soil air—Compositions of atmospheric air and soil air—Gaseous exchange—Influence of soil air on plant growth, soil properties and nutrient availability—Measurement of oxygen diffusion rate—Measures to improve soil aeration. Soil reaction, pH, soil acidity and alkalinity, buffering, effect of pH on nutrient availability. Soil colloids— Definition—General properties—Shape, surface area, electrical charge, adsorption, flocculation, deflocculation, plasticity, cohesion, swelling, shrinkage,Tyndall effect and Brownian movement. Secondary silicate clay minerals of different types—Kaolinite, illite, montmorillonite and chlorite— Properties—Allophones. Origin of charge in organic and inorganic colloids—Negative and positive charges. Differences between organic and inorganic soil colloids.

UNIT-5

Adsorption of ions—Types of ion exchange—Cation and anion exchange—Cation and anion exchange capacities of soil-Base saturation-Factors affecting ion exchange capacity of soils-Importance of Cation Exchange Capacity (CEC) of soils. Calculation of base exchange capacity and exchangeable acidity. Soil biology-Biomass-Flora and fauna-Their important characteristics-Role of beneficial organisms-Organic matter decomposition, mineralization and immobilization. Nitrogen fixation, denitrification, solubilization of phosphorus and biological control of plant diseases— Promotion of plant growth promoting substances- Harmful activities of soil organisms. Soil organic matter-Various sources-Composition- Compounds in plant residues. Their decomposability-Humus-Definition-Synthesis of humus. Soil organic matter and humus-Importance-Fractionation of soil humus-Carbon cycle-Carbon: nitrogen(C:N) ratio of commonly available organic residues—Significance of C:N ratio in soil fertility. Soil classification-Early system of soil classification-Diagnostic horizons. Soil taxonomy-Order, suborder, great group and family series-Nomenclature according to soil taxonomy. Soil groups of India-Alluvial soils, black soils, red soils, laterite soils and coastal sands.

Practicals

- 1. Methods of chemical analysis, principles, techniques and calculations
- 2. Study of soil sampling tools, collection of representative soil sample, its Processing and storage.
- 3. Description of soil profile in the field.



- 4. Studies of capillary rise phenomenon of water in soil column and water movement in soil.
- 5. Determination of texture by feel method.
- 6. Determination of mechanical composition of soil using Bouyoucos Hydrometer.
- 7. Determination of bulk density and particle density of soil and porosity.
- 8. Determination of soil moisture content by gravimetric method.
- 9. Determination of infiltration rate.
- 10. Determination of soil strength by cone penetrometer.
- 11. Aggregate analysis by wet sieving method.
- 12. Determination of soil pH & EC of soil.
- 13. Determination of cation exchange capacity of soil.
- 14. Determination of soil colour& study of soil map.
- 15. Estimation of organic matter content in soil.
- 16. Determination of heat transfer in soils.

- 1. Indian Society of Soil Science. 2012. Fundamentals of Soil Science, IARI, New Delhi.
- 2. Das, D.K. 2015. Introductory Soil Science, 4 Edition, Kalyani Publishers, New Delhi
- 3. Sehgal, J.2015. A Text Book of Pedology– Concepts and Applications, Kalyani Publishers, New Delhi.



ENTO A12131 FUNDAMENTALS OF ENTOMOLOGY 3(2+1) (INSECT MORPHOLOGY & TAXONOMY) UNIT- 1

History of Entomology in India - Contributions of eminent entomologists - Locations and year of establishment of entomological institutions - Arthropoda - Mention of insects in scripts – Contributions of Aristotle, J.C. Fabricius, J.G. Koenig, Carolius Linnaeus, Cramer, Dury, Dr. Kerr, Rev Hope Rothney, Ronald Ross, L De Niceville, H.M Lefroy, T.B.Fletcher, E.P. Stebbing, T.V. Ramakrishna Ayyar, B.V. David, Y.Ramachandra Rao, M S Mani, S Pradhan, H.S. Pruthi, M.R.G.K. Nair and S. Pradhan; ML Roonwal, T.Kumara Swami, M R G K Nair, K.K. Nayar and N. Ananthakrishnan - Locations and year of establishment of Division of Entomology, IARI, Zoological Survey of India (ZSI), Directorate of Plant Protection, Quarantine and Storage (DPPQS), Indian Institute of Natural Resins and Gums (IINRG), National Bureau of Agricultural Insect Resources (NBAIR), National Institute of Plant Health Management (NIPHM), National Centre for Integrated Pest Management (NCIPM) and Forest Research Institute (FRI). Contributory factors for abundance of insects – Major structural characters, developmental characters and protective characters (Morphological, physiological, behavioural and construction of protected niches) of Insecta in Animal Kingdom. Classification of Phylum Arthropoda up to Classes – Different Classes of Arthropoda and comparison of characters of Class Insecta with Arachnida, Crustacea, Symphyla, Chilopoda, Diplopoda and Onychophora; Structure and functions of body wall and moulting - Different layers, chemical composition, functions of body wall and cuticular appendages – Cuticular processes and cuticular invaginations - Chaetotaxy - Moulting - Apolysis, ecdysis and sclerotization. Body segmentation of the insects – Head (Syncephalon) – Procephalon and gnathocephalon, types of head, sclerites and sutures of insect head - Thorax – Segments and appendages (wings and legs). Abdomen – Segments, pre and post genital appendages (Furcula, cornicles, tracheal gills and pseudo ovipositor in Diptera - Propodeum, petiole and gaster in Hymenoptera) - Male and female genital organs - Epimorphic and anamorphic development in insects.

UNIT- 2

Antenna – Structure of typical antenna and its modifications in different insects with examples. Mouthparts – Biting and chewing, sucking (Piercing and sucking, Rasping and sucking, Chewing and lapping, Sponging and Siphoning/ Simple sucking), mask and degenerate types with examples. Legs – Structure of a typical insect leg and modifications of insect legs with examples, Wings – Venation, margins and angles – Types of wings and wing coupling organs with examples. Types of Metamorphosis and diapause – Metamorphosis- Ametamorphosis- Incomplete Metamorphosis or



Direct or Simple Metamorphosis- Intermediatemetamorphosis - Complete Metamorphosis or Complex or Indirect Metamorphosis- Hypermetamorphosis with examples - Diapause- Obligate and facultative diapause - Stage of occurrence of diapause with examples. Types of larva and pupa - Differences between nymph and larva - Larva- Protopod- Oligopod (Campodeiform and Scarabaeiform)- Polypod and Apodus with examples - Pupa- Obtect- ExarateCoarctate- Chrysalis with examples.

UNIT-3

Digestive system – Alimentary canal – Structure of foregut, midgut and hindgut – histology, functions, filter chamber and peritrophic membrane – Process of digestionExtra intestinal digestion. Circulatory system – Open and closed types – Organs of circulatory system – Dorsal blood vessel (diaphragms, sinuses and accessory pulsatile organs) – Process of circulation - Types of haemocytes – Properties and functions of haemolymph. Excretory system – Structure, functions and modifications of malpighian tubules ¬ Structure and functions of other organs of excretion. Respiratory system – Tracheal system – Structure of spiracle and trachea – Classification based on functional spiracles and other means of respiration. Nervous system – Neuron and its types (based on structure and function) – Synapse, ganglia, central nervous system, sympathetic nervous system and peripheral nervous system. Reproductive system – Structure of male and female reproductive systems – Structureand types of ovarioles and structure of follicle – Types - Special modes of reproduction in insects.

UNIT- 4 Secretory (endocrine) system – Structure and functions of neurosecretory organs(neuro secretory cells of brain, corpora cardiaca, corpora allata, prothoracic glandsand ring gland). Sense organs – Compound eyes – Structure of ommatidium - Ocelli - Dorsal ocelli and lateral ocelli - Types of images and auditory organs (auditory hairs, tympanum, Jhonston's organ and pilifer organ) – Chemoreceptors. Taxonomy – Importance - History – Binomial nomenclature - Holotype, allotype and paratype - Suffixes of tribes, subfamily, family and superfamily - Law of priority -Synonyms and homonyms - Definitions of biotype - Subspecies - Species - Genus -Family and Order. Characters of Class Insecta - Economic classification of insects-Classification upto Orders - Subclasses - Apterygota and Pterygota- Names of Orders of Apterygota and Pterygota with examples - Orthopteroid, Hemipteroid and Panarpoid group of orders. Orthoptera – General characters - Gryllidae, Acrididae, Tettigonidae and Gryllotalpidae – Characters with examples. Dictyoptera – General characters – Blattidae and Mantidae – Characters with examples - Odonata - General characters with examples. Isoptera – General characters –Termitidae – Characters with examples - Order - Thysanoptera - General characters - Thripidae - Characters with examples. Hemiptera - General characters - Sub order Heteroptera -



Characters - Cimicidae - Miridae, Pentatomidae, Lygaeidae, Coreidae, Pyrrhocoridae - Characters with examples. Hemiptera - Suborder Homoptera - Characters - Delphacidae, Cicadellidae, Aleurodidae, Aphididae, Coccidae, Pseudococcidae, Lopophidae- Characters with examples - Neuroptera - General characters - Chrysopidaecharacters with examples.

UNIT-5

Lepidoptera-General characters - Differences between moths and butterflies - Noctuidae, Lymantriidae and Sphingidae and Pieridae- Characters with example. LepidopteraGeneral characters - Pyralidae, Crambidae, Gelechiidae, Lycaenidae, Arctiidae, Papilionidae, Saturniidae and Bombycidae - Characters with examples. Coleoptera - General characters — Scarabaeidae, Coccinellidae, Chrysomelidae, - Characters with examples. Coleoptera - General characters — Cerambycidae, Bruchidae, Apionidae and Curculionidae - Characters with examples. Hymenoptera - General characters — Tenthredinidae, Ichneumonidae, Braconidae, Chalcididae, Trichogrammatidae, and Apidae- Characters with examples. Diptera -General characters - Culicidae, Cecidomyiidae, Muscidae, Tachinidae, Agromyzidae and Tephritidae - Characters with examples.

Practical

- 1 Methods of collection and preservation of insects including immature stages.
- 2 External features of Grasshopper / Blister beetle.
- 3 Study of types of mouthparts Biting and chewing, piercing and sucking, rasping and sucking, chewing and lapping, sponging and siphoning.
- 4 Study of different types of insect antennae and legs.
- 5 Study of wing venation, types of wings and wing coupling mechanisms.
- 6 Study of different types of insect larva and pupa.
- 7 Dissection of digestive system in insects (Grasshopper).
- 8 Dissection of female and male reproductive systems in insects (Grasshopper).
- 9 Study of characters of Orders Orthoptera, Dictyoptera and their families and Odonata.
- 10 Study of characters of Orders Isoptera and Thysanoptera and their families.
- 11 Study of characters of Orders -Hemiptera and its sub order Heteroptera and their families.
- 12 Study of characters of Sub Order Homoptera and its families.
- 13 Study of characters of Order- Neuroptera and Lepidoptera and their families.
- 14 Study of characters of Order- Coleoptera and its families.
- 15 Study of characters of Order- Hymenoptera and its families.
- 16 Study of characters of Order Diptera and its families.



- 1. Chapman, R. F 2013 Insects: Structure and Function. Ed by Simpson, S. J. and Douglas, A. C. Cambridge Univ. Press, UK.
- 2. Richards, O.W. and Davies, R.G 1977. Imm's General Text Book of Entomology (Vol. I and II). Chapman and Hall, London.
- 3. Wigglesworth, V.B 2013. Insect Physiology. Springer (Originally published by Chapman and Hall, London, 1974).
- 4. Pant, N.C. and Ghai, S. 198. Insect Physiology and Anatomy. ICAR, New Delhi.
- 5. Kapoor, V. C 2008. Theory and Practice of Animal Taxonomy. Oxford and IBH Publishing, New Delhi.
- 6. Charles A Triplehom and Norman F. 2005. Borror and De Long's Introduction to the Study of Insects. Johnson Thomson Brooks/Cole Publishing. U.S.A.
- 7. Snodgrass, R.E. 2001. Principles of Insect Morphology. CBS Publishers & Distributors, Delhi.
- 8. Timbhare, D.B. 2015. Modern Entomology, Himalaya Publishing House.



Course Code A12151 SOIL AND WATER CONSERVATION ENGINEERING

Credits: 2(1+1)
Course outlines

UNIT-1

Introduction to soil and water conservation and causes of soil erosion. Definition and agents of soil erosion, water erosion - Forms of water erosion - Gully classification and control measures. Soil loss estimation by universal soil loss equation - Soil loss measurement techniques. Principles of erosion control - Introduction to contouring, strip cropping.

UNIT-2

Contour bund - Graded bund and bench terracing. Grassed water ways and their design. Wind erosion Mechanics of wind erosion, types of soil movement - Principles of wind erosion control and its control measures.

UNIT- 3 Introduction to irrigation - Classification of irrigation projects. Importance of irrigation water measurements - Volumetric, area velocity, dischargemethods - Weirs, orifice, flumes. Open channel hydraulics - Discharge calculations.

UNIT-4

Types of wells - Water lifting devices - Classification of pumps, their capacity, power requirement and discharge calculations. Functional components and working principle of underground pipeline systems. UNIT-5 Functional components of micro irrigation systems and its design like drip, sprinkler irrigation systems etc. Water harvesting techniques - Lining of ponds, tanks and canal systems.

Practical

- 1. Practicing survey Principles and educating to use pacing technique for measurement. 2&3. Area calculations through chain survey GPS demo for tracking and area measurement.
- 4. Estimation of soil loss and calculation of erosion index.
- 5. Leveling concepts and practical utility in agriculture.
- 6. Preparation of contour maps.
- 7. Concept of vegetative water ways and design of grassed water ways.
- 8. Construction of contour and graded bunds. 9. Wind erosion and estimation process. 10&11. Water discharge measurements lab exercises for computing discharge.
- 12&13. Different irrigation pumps and their constructional differences.
- 14. Farm pond construction and its design aspects.



- 15. Farm pond and canal lining and its procedures.
- 16. Visit to nearby farm pond.

- 1. Ghanshyam Das., 2012. Hydrology and Soil Conservation Engineering, including Watershed Management. Second edition, PHI Learning Private Limited, New Delhi 110001
- 2. Murthy, V. V.N., 2004. Land and Water Management Engineering. Kalayani Publishers, New Delhi
- 3. Michael A.M., 2007. Irrigation Theory and Practice. Second edition. Vikas Publishing House Pvt. Ltd.
- 4. Mal, B. C. 1995. Introduction to Soil and Water Conservation Engineering. Kalayani Publishers, Rajinder Nagar, Ludhiana
- 5. Kanetakar, T. P. 1993. Surveying and Leveling. Pune Vidyarthi Griha, Prakashan, Pune
- 6. Suresh, R. 2008. Land and Water Management. Standard Publishers Distributors, Delhi.



Course Code A12162 FUNDAMENTALS OF CROP PHYSIOLOGY Credits 3(2+1) UNIT- 1

Introduction to Crop Physiology and its importance in Agriculture. Plant cell- The endo membrane system-Plasma membrane, endoplasmic reticulum, nuclear envelope, golgi apparatus, vacuole and endosomes- Structure and functional characteristics- Plastids, mitochondria, oil bodies, peroxisomes and glyoxysomes - Structure and functions. Metabolic changes during seed development- Seed viability and seed vigor- Tests of viability and vigor- Physiological maturity, harvestable maturity- Indices of physiological maturity in crops- Seed germination- Metabolic changes during seed germination. Growth and Development - Definition - Growth analysis – Growth Parameters- Definitions and mathematical formulae.

UNIT-2

Absorption of water- Diffusion and osmosis- water potential and its components Importance of water potential— Active and passive uptake of water— Stomatal complex— Transpiration—Water use efficiency— Water use efficiency of C3, C4 and CAM plants— Water requirement /Transpiration ratio — Factors affecting WUE. Mineral nutrition of plants— Essential mineral elements— Criteria of essentiality of mineral elements— Mengel's classification of mineral nutrients— Nutrient up take mechanisms-Functional roles of N, P, K, S Ca and Mg—Functional roles of Fe, Mn, Cu, Zn, B, Mo, Cl, Na, Co and Si— Deficiency symptoms of macro and micro nutrients. Assimilation of mineral nutrients— Nitrate assimilation— Ammonium assimilation in plants— Biological nitrogen fixation— Free living and symbiotic bacteria —Nodule formation— Nitrogenase enzyme complex.

UNIT-3

Photosynthesis— Reactions of photosynthesis— Energy synthesis— Principle of light absorption by plants— Light reactions-Cyclic and non cyclic photo phosphorylation— CO2fixation— C3 and C4 pathways—Significance of C4pathway— CAM pathway and its significance—Photo respiration and its significance—Photosynthetic efficiency of C3, C4 and CAM plants—Factors affecting photosynthesis (light, CO2, temp and water stress)—Relationship of photosynthesis and crop productivity. Respiration—Energy balance—Significance of respiration—Oxidative Pentose Phosphate Pathway (OPPP) and its significance—Growth respiration and maintenance respiration—Alternate respiration—Salt respiration—Wound respiration.

UNIT- 4

Lipid metabolism – Bio synthesis of fatty acids in plastids – Functions of lipids - Significance of lipids in plant metabolism. Physiology of flowering – Photo periodism and flowering – Importance of photo periodism – Classification of plants based on



photoperiodic responses - Perception of photoperiodic stimulus—Biological clock—Phytochrome—Flowering hormones—Vernalization and flowering—importance of vernalization in agriculture. Plant growth regulators—Auxins—Occurrence, transport, biosynthesis, mode of action and physiological roles—Commercial uses.—Gibberellins—occurrence, transport, biosynthesis, mode of action and physiological roles—Commercial uses—Cytokinins—Occurrence, transport, biosynthesis, mode of action and physiological roles—commercial uses—ABA—Occurrence, transport, biosynthesis, mode of action and physiological roles—Commercial uses—Ethylene—Ocurrence, transport, biosynthesis, mode of action and physiological roles—Commercial uses.—Commercial uses.

UNIT-5

Senescence and abscission – Definition – Classification of senescence – Physiological and biochemical changes that occur during senescence- Prevention of leaf and flower senescence—Abscission and its relationship with senescence. Postharvest physiology— Dormancy— Types of dormancy— Advantages and disadvantages of dormancy- Causes of dormancy—Remedial measures for breaking seed dormancy- Fruit ripening- Climacteric and non climacteric fruits— Metabolic changes during fruit ripening- Hormonal regulation of fruit ripening— Ripening induction and ripening inhibition—Use of hormones in increasing vase life of flowers.

Practical:

- 1. Preparation of solutions
- 2. Imbibition of seed
- 3. Seed vigour and viability tests
- 4. Optimum conditions for seed germination
- 5. Measurement of leaf area by various methods
- 6. Growth analysis calculation of growth parameters
- 7 Measurement of water status in roots, stems and leaves
- 8 Measurement of water potential by Chardakov's method
- 9 Absorption spectrum of chloroplast pigments
- 10 Leaf anatomy of C3 and C4 plants
- 11 Stomata frequency and Index
- 12 Effect of ABA on regulation of stomata
- 13 Effect of plant growth regulators on plant growth
- 14 Plasmolysis of cell
- 15 Identification of nutrient deficiency symptoms in field crops
- 16 Yield Analysis



References

- 1.Taiz,L.andZeiger,E.2010.PlantPhysiology5 thedition, Sinauer Associates, Sunderland, MA,USA.
- 2. Gardner, F.P., Pearce, R.B., and Mitchell, R.L. 1985. Physiology of Crop Plants. Scientific Publishers, Jodhpur.
- 3. Noggle, G.R. and Fritz, G.J., 1983. Introductory Plant Physiology. 2 nd Edition. Prentice Hall Publishers, New Jersey, USA.

Course Code A12171 Credits3 (2+1) FUNDAMENTALS OF PLANT PATHOLOGY-I (PLANT PATHOGENS— AN INTRODUTION)

UNIT-1

Introduction to Plant Pathology- Definition of Plant Pathology, Plant Pathogen, Plant Disease, Symptom, Disorder. Importance of plant diseases- Brief mention of Important epidemics of international importance – Irish Famine (1845), Bengal Famine(1942), Coffee rust (1868), Wheat Rust (1940), Southern Corn Leaf blight in USA. Epidemics of local significance- Peanut Stem Necrosis Disease (Anantapur dt), Mung bean yellow mosaic virus (AP)etc. Brief mention of economic importance of microorganisms. Scope and objectives of Plant Pathology. Important plant pathogenic organisms with one or two examples of important plant diseases caused by them - fungi (riceblast ,wheat rust), Chromista (Pythium damping off, late blight of potato protozoa (coffee phloem necrosis, club root of crucifers) bacteria rice bacterial leaf blight (BLB), cotton blackarm), fastidious Vascular bacteria (sugarcane ratoon stunt, citrus greening), Phytoplasma (sugarcane grassy shoot, sesamum phyllody), Spiroplasma (cornstunt), viruses (TMV,MYMV), viroids (potato spindle tuber viroid, coconut cadangcadang). Important plant pathogenic organisms with one or two examples of important plant diseases caused by them (contd)- algae (redrust), plant parasites (Cuscuta, Striga, Orabanche, phanerogamic nematodes(root knot and cyst nematode). Diseases and symptoms due to abiotic causes (khaira, cotton purple leaf, tomato blossom end rot, black heart of potato). General characteristics of fungi, fungus definition. Somatic structures- types of fungalthalli- plasmodium, unicellular and filamentous. Types of fungi based on reproductive structures- eucarpic, holocarpic. Types of fungi based on their physical presence on or In the host- ectophytic and endophytic (intercellular, intra cellular and vascular). Septation in fungi-Primary, adventitious, perforated and dolipore septa. Fungal tissues - plectenchyma (prosenchyma and pseudo parenchyma). Modifications of mycelium (rhizomorphs, sclerotium, stroma, haustorium, rhizoids and appressorium). Ultra structure of fungal cell. Fungal nutrition- groups of fungi based on mode of nutritionsaprophytes (obligate saprophytes and facultative parasite), parasites (obligate parasites and facultative saprophytes) and symbionts



(mycorrhizaeand lichens). Reproduction in fungiasexual reproduction (mitospores)-fragmentation (arthrospores, oidia, chlamydospores), fission, budding (blastospores), and sporulation – Sporangium, sporangiole, merosporangium. Spores-Plano and Aplano spores. Planospores – flagellum structure, types of flagella- tinsel, whiplash, Monoflagellate, Biflagellate, Anisokont and Heterokont zoospores. Conidiophore and Conidiospores (conidia). Asexual fruiting bodies with examples.

UNIT-2

Sexual reproduction— Phasesin sexual reproduction, (meiospores). Methods of plasmogamyplanogametic copulation, gametangial contact, gametangial copulation, spermatization and somatogamy. Various life cycle patterns displayed by fungihaplobiontic haploid, haplobiontic haploid (modified), haplobiontic diploid and diplobiontic life cycles with examples. Para sexual cycle. Sexual spores in fungi. Taxonomy - Nomenclature, Binomial system of nomenclature, rules of nomenclature, Classification of fungi as per Kirk et al(2008)- Keyto phylum, sub- phyla, classes, orders and families. Major characteristic features of Kingdom Fungi, hromistaand Protozoa. Characteristics of Phyla Chytridiomycota, Zygomycota, Ascomycota, Basidiomycota and Mitosporic fungi (Anamorphic fungi) in Kingdom Fungi. Kingdom Fungi- Phylum Chytridiomycota, Class Chytridiomycetes- important characteristics Order Chytridiales-Family Synchytriaceaedisease caused Synchytriumendobioticum (potatowart). Phylum Zygomycota-Subphylum Mucoromycotina- Order Mucorales- Family Mucoraceae, Genus Rhizopus, Example of disease caused by Rhizopusarrhizus (Headrotofsunflower). Family Choanephoraceae, Genus Choanephora. Example of disease caused by Choanephoracucurbitarum (Choenophora blight of chillies). Phylum Ascomycotaimportant characteristics of the phylum. Different types of ascocarps. Stile structures in ascocarps. Ascospore development in Pyronemaomphaloides. Morphology of asci. Types of asci based on structure of ascus wall, asci arrangement -fascicle, hymenium.

UNIT-3

Phylum Ascomycota, subphylum Taphrinomycotina (=Archiascomycetes) – Class Taphrinomycetes– Order Taphrinales, (i) Family Taphrinaceae- diseases caused by Taphrina deformans (peach leafcurl) and T.maculans (turmeric blotch). (ii) Family Protomycetaceae– Disease caused by Protomycesmacrospores (stem gall of coriander). Phylum Ascomycota Subphylum Pezizomycotina– (i) Class Eurotiomycetes– Subclass Eurotiomycetidae Order Eurotiales– Genera Eurotium, Emericella (Aspergillus flavus– aflatoxins), Talaromyces(Penicillium italicum– citrusbluemold). (ii) Class Leotiomycetes Order Erysiphales Family Erysiphaceae-



Erysiphe, Leveillula, Phyllactinia, Uncinula, Sphaerotheca, Podosphaeraand Microsphaera(key for genera of Erysiphaceae based on position of fungus on /in the host, conidial stages, number of asci per cleistotheciumand cleistothecial appendages) - Important diseases caused by each of the genera. Order Helotiales Family Sclerotiniaceae Genus Sclerotinia (Sclerotinia sclerotiorum- white mold of vegetables). Phylum Ascomycota, Subphylum Pezizomycotina- (iii) Class Subclass Sardariomycetidae Order Sordariomycetes, DiaporthalesFamily Genus Cryphonectria(chestnut blight) .Subclass Cryphonectriaceae, Hypo creomycetidae Order Hypocreales - Family-Clavicepitaceae, Claviceps(ergot ofsorghum and bajra). Family -Hypocreaceae-Genus-Hypocrea (Anamorph - Trichoderma, bio control agent), (iv) Class DothidiomycetesSubclass -Dothidiomycetidae Order- Capnodiales- Family- Mycosphaerellaceae- Genusarachidicola(Groundnut Mycosphaerella(M. early spot), M.personata(Groundnut late leaf spot), M. pinodes(Ascochyta blight of chickpea). Order – Myriangiales – Family – Elsinoaceae – Genus – Elsinoe (E. ampelina – Grape anthracnose). Subclass - Pleosporomycetidae- Order - Pleosporales Family-Venturiaceae- Genus - Venturia (V. inaequalis- Apple scab). Family-Pleosporaceae – Genus – Cochliobolus (C. miyabeanus – brown spot of rice). Phylum characteristics-Basidiomycotaimportant Primary, Secondary Tertiarymycelium, doliporeseptum, clamp connections. Development of basidium and basidiospores, parts of basidium, dispersal of basidiospores, structure of Agaricus bisporus basidiocarp. Phylum Basidiomycota-Subphylum Pucciniomycotina -Class **Pucciniomycetes** Order Pucciniales-Family-Pucciniaceae- GeneraPuccinia (three rusts of wheat, groundnut rust) Uromyces (rust of green gram and black gram). Family - Melampsoraceae -Genus Melampsora (M. ricini– castor rust). Incertaesedis(no family), Hemileia (H. vastatrix– coffeerust).Class Microbotryomycetes (Pucciniomycetous smuts)-Order Microbotryales -FamilyMicrobotryaceae - Genus -Sphacelotheca(Sorghum grain smut, loose smut and headsmut of sorghum). Macrocyclic, microcyclic, demi cyclic rusts; Autoecious and Heteroecious rusts with examples. Life cycle of Puccinia graministritici. Phylum Basidiomycota - Subphylum 2. Ustilagomycotina Class Ustilaginomycetes Order Ustilaginales- Ustilago (loose smut of wheat, sugarcane whip smut) and Tolyposporium (bajra smut). Order Urocystidales-Family -Urocystidaceae-Genus Urocystis(Onion smut). Class Exobasidiomycetes Order Tilletiales-Family-Tilletiaceae-Genera Tilletia (wheatbunts), Neovossia (Karnal bunt of wheat). Order Exobasidiales-Family-Exobasidiaceae- Genus Exobasidium (Tea blister blight). Differences between rust and smut fungi. Differences between smuts Basidiomycota-Subphylum3.Agaricomycotina and bunts Phylum Class



Agaricomycetes-Incertaesedis (nosubclass) Order Polyporales - Family Ganodermataceae - Genus Ganoderma (coconut root rot and wilt).

UNIT-4

(Mitosporic fungi= Fungi Imperfecti) Anamorphic Fungi Characteristics. (1) Hyphomycetous anamorphic fungi: Saccardoanspore group system. Identification features of Genera Alternaria (sunflower and sesamum leaf blight). Botrytis (castor grey mold), Helminthosporium (maize turcicum leaf blight), Bipolaris (riebrownspot), Cercospora (groundnut early leaf spot), Phaeoisariopsis (groundnut late leaf spot), Fusarium (cotton wilt), Pyricularia (riceblast), Verticillium (cottonwilt), MyceliaSterilia - Rhizoctonia (rice sheath blight, dry root rot), Sclerotium (stem rot of groundnut). Acervular Imperfect Fungi- Colletotrichum (sugarcane red rot), Pestalotiopsis (coconut greyleafspot), Pestalotia (guava leafspot), Gloeosporium (grape anthracnose). Pycnidia Imperfect Fungi – Ascochyta (chickpea blight), Phoma(blackleg of crucifers), Phomopsis (brinjal fruitrot) ,Phyllosticta(ginger leafspot), Macrophomina(dry rootrot) Diplodia (rose dieback), Botryodiplodia (citrus stem end rot), Septoria(leaf spot of tomato). Kingdom Chromista: Characteristics of Phylum Oomycota. Important characteristics of Class Oomycetes, Subclass-Peronosporomycetidae. Order Pythiales- Family- Pythiaceae- Genus- Pythium (damping off of nursery crops). Order Albuginales- Family- Albuginaceae- Genus-Albugo (white rust). Order PeronosporalesFamily -Peronosporaceae- Genus -Phytophthora (late blight of potato). Downy mildew fungi Sclerospora (green ear of bajra), Peronospora (blue mold of tobacco), Peronosclerospora(sorghum downy mildew), Pseudoperonospora (cucurbitdownymildew), Plasmopara (grapedownymildew) and Bremia (lettucedownymildew) Sporangiophore branching and sporangialcharacteristics of downy mildew genera. Characteristics of Class Plasmodiophoreain Kingdom Protozoa. Important characteristics of Order Plasmodiophorida, Family Plasmodiophoraceae- differences in the characteristics of Plasmodiophora(clubroot of cabbage) and Spongospora (potato powdery scab). Prokaryotes - Characteristics of phytopathogenic bacteria, Classification (2nd Edition of Bergey's Manual of Systematic Bacteriology, 2004). Identification of plant pathogenic bacteria based on morphological features. Domain Bacteria-Phyla Proteobacteria, Firmicutes and Actinobacteria Phylum Proteobacteria- Class RhizobialesFamily-Alphaproteobacteria-Order-Rhizobiaceae-Agrobacterium (crown gall of stone fruits). Also Candidatus Liberobacter (citrus Betaproteobacteria -Order -Burkholdarialesgreening). Class Family BurkholdariaceaeGenus Ralstonia(bacterial wilt of solanaceous crops). Gammaproteo bacteria- Order - Xanthomonadales- Family -Xanthomonadaceae-Genera -Xanthomonas (BLB, BLS, citrus canker), Xylella (Pierce's disease of grapes). Order Pseudomonadales - Family -Pseudomonadaceae-Genus -



Pseudomonas (wild fire of tobacco). Order EnterobacterialesFamily-Enterobacteriaceae- Genera-Erwinia (Applefireblight), Pectobacterium (Soft rot of vegetables).

UNIT-5

Phylum Firmicutes.- Class Bacilli- Order-Bacillus-Family-Bacillaceae-Genus-Bacillus (Class Mollicutes Order Entomoplasmatales -Family- Spiro plasmataceae -(Corn stunt). Order -Acholeplasmatales- Family -Genus Spiroplasma Acholeplasmataceae- Genus- Candidatus Phytoplasma (Sesamum phyllody, Brinjal little leaf). Phylum Actinobacteria -ClassActinobacteria- Order- Actinomycetales -Family- Microbacteriaceae- Genus Clavibacter (Wheat yellow ear rot/ tundu, sugarcane ration stunt). Family Streptomycetaceae Genus Streptomyces (Potato scab). Viruses and viroids- important characteristics of plant viruses and viroidsmultiplication-classification of viruses based on nucleic acid (single stranded (ss) RNA, double stranded (ds) RNA, ss DNA and dsDNA). Taxonomy based on ICTV (2005). Important plant viral diseases- Tobacco Mosaic Virus (TMV) and Rice Tungro Virus (RTV). Methods of transmission of plant viruses with examples of vector transmitted virus diseases. Examples of important viroid diseases- potato spindle tuber viroid and coconut cadangcadang. Study of phanerogamic plant parasites with suitable examples -Cuscuta, Orabanche, Striga, Loranthus. Nematodes- Economic importance in agriculture- General characters of plant parasitic nematodes -classification. Nematodes- symptoms and nature of damage caused by plant nematodes (Heterodera, Meloidogyne, Anguina, Ditylenchus, Tylenchorhynchus, Aphelenchoides etc.).

Practical

- 1. Microscopy study of the parts of microscope.
- 2. Study of vegetative structures of fungi and their modifications.
- 3. Study of reproductive (sexual and asexual) structures of fungi.
- 4. Study of Zygomycetous fungus—Rhizopus, Choanephora.
- 5. Study of downy mildew fungi Sclerospora, Peronosclerospora, Pseudoperonospora, Peronospora, Plasmoparaand Bremia. Study of Pythium, Phytophthora and Albugo.
- 6. Study of powdery mildew fungi- Oidium, Oidiopsis, Ovulariopsis.
- 7. Study of ascocarps of Erysiphe ,Phyllactinia, Uncinula, Podosphaeraand Microsphaera..
- 8. Study of rust fungiPuccinia (different stages), Uromyces, Hemileiaand Melampsora. 9. Study of smut fungi- Sphacelotheca, Ustilagoand Tolyposporium. Studyof Ganoderma and Agaricus.



- 10. Study of acervulous imperfect fungi-Colletotrichum and Pestalotiopsis. Study of pycnidial imperfect fungi Septoria.
- 11. Study of imperfect fungi Aspergillus, Penicillium and Pyricularia, Helminthosporium, Alternaria.
- 12. Study of imperfect fungi–Cercosporaand Phaeoisariopsis, Fusarium, Rhizoctonia And Sclerotium.
- 13. Isolation of phytopathogenic bacteria (locally available diseased plant material) and study of colony characteristics
- 14. Demonstration of mechanical transmission of plant viruses.
- 15. Extraction of plant parasitic nematodes from soil.
- 16. Study of morphological features and identification of plant parasitic nematodes.

References: For Fungi:

- 1. Dube, H.C.2013. An Introduction to Fungi.4th(Edition).Scientific Publishers, Jodhpur, India. (major textbook)
- 2. Webster, J. 1989. Introduction to fungi. Cambridge Univ. Press(for life cycles of Fungi)
- 3. Dasgupta, M.K.1987. Principles of Plant Pathology. Allied Publ. Pvt Ltd. p985. (forrust lifecycles)
- 4. Students are also advised to refer Introductory Mycology by Alexopoulus, Mims th and Blackwell (4 Edition) for Fungi.
- 5. For Bacteria, Viruses, Viroids, Phanerogamic Plant Parasites, Nematodes
- 6. Agrios, G.N.2006. Plant Pathology. Elsevier Publishers, New Delhi.



Course Code A12182 PRODUCTION TECHNOLOGY OF FRUITS Credits 2 (1+1) AND PLANTATION CROPS

UNIT-1

Importance and scope of fruit crops-High density planting- Canopy management-Use of rootstocks in fruit crops. Production technologies of Mango - Botanical name - Family — Origin — Introduction- Varieties—Climate—Soil-Propagation-Planting-Manuring-Irrigation— Inter-Cultivation—Harvesting—Yield-Physiological disorders: (Fruit drop-Alternate bearingSpongy tissue etc). Production technology of Banana-Botanical name-Family—OriginImportance-Varieties—Climate—Soil-Propagation-Planting—Manuring-Irrigation—Inter Cultivationpractices—Harvesting—Yield and postharvest handling-Physiological disorders. Production technology of Citrus-Botanical name—Family-Origin-Introduction-Varieties— Climate—Soil-Propagation-Planting-Manuring-Irrigation—Inter-Cultivation— Harvesting— Yield—Physiological disorders- Fruit drop—Granulation etc.

UNIT-2

Production technology of Grape-Botanical name-Family-Origin Introduction-VarietiesClimate-Soil-Propagation-Planting-Manuring-Irrigation—InterCultivation-Harvesting, YieldPhysiological disorders. Production technology of Guava and Litchi-Botanical nameFamily-Origin-Introduction-Varieties—Climate—Soil-Propagation-Planting-ManuringIrrigation—InterCultivation—Harvesting—Yield—Physiological disorders-pests and diseases of litchi. Production technology of Papaya-Botanical name-Family-Origin-IntroductionVarieties—Climate—Soil—Propagation—Planting—Manuring-Irrigation—Inter Cultivation—Harvesting—Yield-pests of papaya.

UNIT-3

Production technology of Apple, Pear, Peach-Botanical name—Family—Origin—Importance— Varieties -Climate —Soil- Propagation- Planting- Manuring- Irrigation—Inter Cultivation— Harvesting—Yield and storage-Physiological disorders-pests of apple, pear and peachdiseases of pear and peach. Production technology of Minor fruits-Pineapple, Pomegranate Botanical name- Family-Origin-Importance-Varieties—Climate—Soil-Propagation-PlantingManuring - Irrigation—Inter-cultivation—Harvesting—Yield —Physiological disorders-pests of pomegranate-pests and diseases of pineapple. Production technology of Jackfruit, Strawberry, Nut crops (Almond & Walnut)- Botanical name- Family- Origin- Importance Varieties — Climate —Soil- Propagation- Planting-Manuring-Irrigation—Inter cultivation— Harvesting—Yield-Physiological disorders- pests and diseases.



UNIT- 4

Plantation crops-Scope and Importance-Coconut—Botanical name-Family-OriginImportance-Varieties—Climate—Soil-Propagation-Planting-Manuring-Irrigation—Inter cultivation—Harvesting—Yield—Processing- Physiological disorders. Production technology of Areca nut-Botanical name-Family-Origin-Importance-Varieties—Climate—SoilPropagation-Planting-Manuring-Irrigation—Inter cultivation—harvesting—Yield—Processing diseases of Areca nut. Production technology of Cashew-Botanical name-Family- Origin Importance- Varieties—Climate—Soil-Propagation-Planting-Manuring-Irrigation—Inter cultivation— Harvesting—Yield—Processing- diseases of Cashew.

UNIT-5

Production technology of Tea-Botanical name-Family-Origin-Importance- Varieties—Climate—Soil-Propagation-Planting-Manuring-Irrigation—Inter cultivation—Harvesting—Yield-Processing—pests of Tea. Production technology of Coffee-Botanical name-Family Origin-Importance- Varieties—Climate—Soil-Propagation-Planting-Manuring-Irrigation—Inter cultivation—Harvesting—Yield-Processing- pests of Coffee. Production technology of Rubber-Botanical name-Family-Origin-Importance- Varieties—Climate—Soil-PropagationPlanting-Manuring-Irrigation—Inter cultivation—Harvesting—Yield-Processing - Physiological disorders- pests and diseases of Rubber.

Practical

- 1. Seed propagation-Scarification and stratification of seeds.
- 2. Propagation methods for fruit crops.
- 3. Propagation methods for plantation crops.
- 4. Micro-propagation.
- 5. Description and identification of commercially important fruit crops in Telangana state (Dragon Fruit, Custard Apple, Fig and Sapota).
- 6. Preparation of plant bio regulators and their uses.
- 7. Identification and description of varieties of major fruit crops (Mango, Banana, Citrus, Guava Grape and Apple).
- 8. Training and pruning methods followed in fruit crops.
- 9. Different methods of manuring and fertilization in fruit and plantation crops.
- 10. Different inter cultural practices/operations followed in fruit and plantation crops.
- 11. Postharvest handling and storage of fruit crops.
- 12. Fruit maturity and ripening and shelf life extension in fruit crops.
- 13. .Physiological disorders of fruit crops-Mango, Citrus, Grape
- 14. Physiological disorders of fruit crops-Banana, apple and other minor fruit crops.
- 15. Physiological disorders of the plantation crops.



16. Visit to commercial plantations/ fruit orchards.

References

- 1. Bose, T. K. and Mitra, S. K. 1990. Fruits-Tropical and Sub-tropical. Naya Prakashan, Calcutta.
- 2.Chattopadhya,P.K.Year.TextBookonPomology(Fundamentals of Fruit Growing). Kalyani Publishers, Ludhiana.
- 3.BijendraSingh.2012.HorticultureataGlance.KalyaniPublishers,Ludhiana
- 4. Parthasarathy, V. A., P.K. ChattopadhyayandBose, T.K. 2006. Plantation Crops. Voll and II. Parthasankarbasu Naya Udyog, Kolkata.
- 5.Kumar, N., Abdul Khader, J.B.M, Rangaswamy, P.and Irulappan, I. 2004. Introduction to Spices, Plantation crops, Medicinal and Aromatic Crops. Oxford and IBH publishing Co, New Delhi.



Course Code A12010 AGRICULTURAL MICROBIOLOGY Credits 2(1+1)

UNIT- 1

Introduction- Definition- The hidden world of microbiology- How microbes evolved on earth General classification of microbes-Microorganisms and principles of microbiology- Scope of microbiology. Brief History of microbiology - Spontaneous generation theory- Contributions of Antony Van Leeuwenhoek- Francesco Redi-Lazzaro Spallanzani-Franz Schulze-Schroder and Von Dusch-Louis Pasteur- John Tyndall. Role of microbes in fermentation-Contributions of Cagnaird Latour-Theodor Schwann, F. Kutzing- Louis Pasteur - Germ theory of disease - Contribution of Hippocrates-Louis Pasteur- Robert Koch - Pure Culture Methods- Joseph Beijerinck Winogradsky-Francois Appert-Schroder ListerRobert Koch-VonDush- John Tyndall. Protection against infection-Contributions of Edward Jenner- F. Loeffler- Behirng- Kitasasto Louis Pasteur - Applied aspects of Microbiology- Agricultural microbiology- Industrial microbiology-Food Microbiology -Medical microbiology - Water Microbiology - Geochemical Microbiology - Pollution microbiology - Air microbiology - Exo Microbiology - Microbial biotechnology. Morphological types of Bacteria, Bacteria cell Structure- External and internal cellstructures Differences between Prokaryotes and Eukaryotes.

UNIT- 2

Microbial Nutrition- Autotrophy - Chemoautotrophy- Photo autotrophy. Heterotrophy - Metabolic pathways-Glycolysis-HMP-ED-TCA cycle. Growth of Microorganisms - Cell Division - Growth cycle of bacteria [Lag phase, Log phase, Stationary and Death phase]- Generation time- Growth rate- Growth yield- Synchronous - Diauxic growth. **UNIT- 3**

Bacterial genetics- Genetic recombination- Transformation- Conjugation-Transduction Plasmids- Transposon. Role of microbes in fertility of soils and plant growth-Rhizosphere- Rhizoplane- Phyllosphere Phylloplane-Microflora-Carbon cycle-Carbondioxide fixation. Nitrogen cycle - Mineralisation- Immobilisation-Nitrification- Denitrification- Nitrogen Fixation - Phosphorus cycle, phosphorus solubilisation - Oxidation - Reduction - Sulphur cycleOxidation and reduction.

UNIT-4

Biological nitrogen fixation - Symbiotic- Associative- Asymbiotic- Nitrogen fixation In Azolla - Blue green algae - Actinorhizal symbiosis - Frankia, Phosphate solubilizing microorganisms - Bacillus-Pseudomonas-Mycorrhiza for Phosphorous uptake. PGPR Organisms- Bacillus - Pseudomonas - Azotobacter -Azospirillum - Rhizobium. Food spoilage, food preservation and food fermentation, Types of



fermentations – Batch - Batch fed- Continuous - Solid State Fermentations, Fermentative production of Alcohol. **UNIT-5**

Biofertilizers (Bacterial-Cyanobacterial-Fungal) production - Silage Production. Biopesticides Viruses (Nucleo polyhedrosis virus - Granular viruses) - Bacteria (Bacillus thuringiensis, Bacillus papilliae) - fungi (Beauveria - Verticillium) - Protozoa (Malameba locustae Mattesia Spp) - Mode of action. Biofuel Production-Biodegradation - Biogas production, Biomanures and Microbiology of Composting.

Practical

- 1. Introduction to microbiology laboratory and equipments.
- 2. Aseptic methods in microbiology practical.
- 3. Methods of sterilization.
- 4. Nutritional media and their preparation.
- 5. Microscope Parts, Principles of microscopy, resolving power, numerical aperture and micrometry.
- 6. Methods of isolation and purification of microbial cultures.
- 7. Maintenance of microbial cultures.
- 8. Isolation of rhizobium from legume root nodule and Azotobacter from soil.
- 9. Isolation of Phosphate solubilizing bacteria / Phosphate solubilizing fungi (PSB/PSF). 10. Isolation of Azospirillum from roots.
- 11. Bacterial Staining procedures-Simple staining, Gram's staining and Endospore staining.
- 12. Microscopic examination of biofertilizer organisms.
- 13. Enumeration of microbial population in soil Bacteria / PGPR
- 14. Enumeration of microbial population in soil Fungi and Actinomycetes.
- 15. Isolation of VAM from soil by wet sieving and decantation technique.
- 16. Determination of VAM by staining the infected roots / Morphological examination of VAM by section cutting.

References

- 1. Microbiology. Pelczar, J.r., M.J.E.C.S. Chan and Krieg, N.R. (5th Ed.) 2015. McGrawHill Publishers, New York.
- 2. Microbiology. Prescott, L.M., Harley, J.P. and Klein, D.A. (9th Ed.) 2014. McGraw Hill Publishers, New York.
- 3. Brock Biology of Microorganisms. Madigan, M., Martinko, J.M and Parker, J. (14Ed.) 2015. Prentice hall of India Pvt Ltd., New Delhi.
- 4. Soil Microbiology: Subba Rao, N.S.(4thEd.) 2014. Oxford and IBH Publishing Company Pvt. Ltd., New Delhi.



- 5. Microbiology A Laboratory Manual: James, C and Natile, S. (10th Ed.) 2014. Pearson India Education Services Pvt. Ltd., South Asia.
- 6. Experiments in Microbiology, Plant Pathology and Biotechnology. Aneja, K.R.2011. New Age International (P) Ltd., Publishers, New Delhi



Item 6:

Approval of the Academic Regulations of the MCA program



ACADEMIC REGULATIONS (AU-R22) For the

Master of Computer Applications (MCA)

With effect from the Academic Year 2022-23



School of Engineering

ANURAG UNIVERSITY

Ghatkesar (M), Medchal-Malkajgiri (Dist), Hyderabad, Telangana 500088

www.anurag.edu.in August, 2022



INDEX

1.	Eligibility for Admissions	118
2.	Course Registration	118
3.	Attendance	119
4.	Assessment of Academic Performance	121
5.	The Grading System	124
6.	Passing Standards:	126
7.	Evaluation of Project/Dissertation Work	126
8.	Award of Degree and Class	128
9.	Withholding of Results	129
10.	Transitory Regulations	129
11.	Convocation	129
12.	Amendments	129
ANN	NEXURE – I: Disciplinary Action against Students – Provisions	130
ANN	NEXURE – II: Malpractice Rules	133
ANN	NEXURE –III: Definitions	137



Academic Regulations for MCA with effect from the Academic Year 2022-23

1. Eligibility for Admissions

- 1.1 Admission to the MCA program shall be made subject to eligibility, qualification and specialization as prescribed by the Anurag University (AU) from time to time.
- 1.2 Students who have passed the Bachelor's Degree examination of any University recognized by Anurag University with minimum three years duration with at least 50% marks (45% marks in case of SC/ST/BC categories) in the qualifying examination with Mathematics at 10+2 level or graduation level.

OR

A B.E. / B.Tech from a recognized University/Institution with at least 50% marks (45% marks in case of SC/ST/BC categories).

1.3 Admissions shall be made on the basis of merit / rank obtained by the candidates at the qualifying Entrance Test conducted by the University or on the basis of any other order of merit as approved by the University, subject to reservations as prescribed by the Telangana State Private Universities Act (Establishment and Regulations) No.11 of 2018.

2. Course Registration

- 2.1 Every student is required to be present and register online at the commencement of each semester on the day fixed for and notified in the academic calendar. The students will choose the courses for registration in consultation with the faculty advisor. The students may also consult the Head of the Department / Dean of the School.
- 2.2 The registration will be organized departmentally under the supervision of the Head of the Department in coordination with faculty advisor.
- 2.3 A student, who does not register on the day announced, may be permitted to register, in consideration of any compelling reason, within the first week. Similarly, a student may be permitted to change the registration for a course within the first week only in



- consultation with respective faculty advisor. No late registration/change of registration shall be permitted after the first week from the scheduled date.
- 2.4 Only those students will be permitted to register who have: (a) cleared all University and Hostel dues of the previous semesters (b) paid all required fees for the current semester, and (c) not been debarred from registering for a specified period on disciplinary action or any other ground.
- 2.5 A candidate shall be given one chance to re-register and attend the classes for a maximum of two courses, if the Continuous Internal Evaluation (CIE) marks secured by a candidate are less than 50% and failed in those subjects but fulfilled the attendance requirement. A candidate must re-register for failed courses within four weeks of commencement of the class work and secure the required minimum attendance to appear for and the Semester End Examination (SEE). In the event of the student taking this chance, his CIE marks and SEE marks obtained in the previous attempt stand cancelled.
- 2.6 Choice Based Credit System (CBCS): The CBCS provides choice for students to select from the prescribed courses of subsequent semesters (core, elective or any other courses) from the 2nd semester onwards. A maximum of one such course is allowed to register in a semester.
- 2.7 Dropping of courses: Within four weeks after the commencement of the semester, the student may, in consultation with the faculty advisor, drop one or more courses. The dropped courses shall be registered in the subsequent semesters as and when it is offered.

3. Attendance

3.1 The following Attendance in all classes (lectures/tutorials, laboratories etc.) is compulsory. A student will not be permitted to appear in the semester end examination on grounds of unsatisfactory attendance. Minimum required attendance in each theory / laboratory course is 75% (including the days of attendance in sports, games, and NCC and NSS activities) for appearing in the semester end examination. Students are advised to monitor the status of their attendance in the online system from time to time. Absence without obtaining sanction of leave will be considered as an act of indiscipline.



- 3.2 Condonation of shortage of attendance in each course up to 10% (65% and above and below 75%) in each semester shall be granted on genuine medical grounds and valid reasons on representation by the candidate with supporting documentary evidence.
- 3.3 Shortage of attendance below 65% in each course shall not be condoned.
- 3.4 Students whose shortage of attendance is not condoned in any course are not eligible to appear for their semester end examination of that course and their registration shall stand cancelled.
- 3.5 However, in respect of women candidates who seek condonation of attendance due to pregnancy, the Vice-Chancellor may condone the deficiency in attendance to the extent of 15% (as against 10% condonation for others) on medical grounds subject to submission of medical certificate to this effect. Such condonation shall be availed only twice during the program of study.
- 3.6 A prescribed fee shall be payable towards condonation of shortage of attendance.
- 3.7 A candidate shall get minimum required attendance at least in three (3) theory courses in the present semester to get promoted to the next semester.

3.8 **Promotion Rules:**

- 3.9 A student shall be promoted from I Year to II Year only if he/she fulfills the academic requirements of securing 50% of average credits up to I Year II Semester, from all the examinations whether or not the candidate takes the examinations.
- 3.10 A student shall register and put up required attendance in all 80 credits and earn all 80 credits for the award of degree.
- 3.11 Students, who fail to earn 80 credits as indicated in the course structure within four academic years from the year of their admission, shall forfeit their admission.
- 3.12 When a student is detained due to shortage of attendance in any semester, no grade allotments or SGPA/CGPA calculations will be done for that entire semester in which he/she got detained.
- 3.13 When a student is detained due to lack of credits in any year, he / she may be readmitted after fulfillment of the academic requirements, with the academic regulations of the batch into which he / she gets readmitted.
- 3.14 For readmitted candidates, if there are any professional electives / open electives, the same may also be re-registered if offered. However, if those electives are not



offered in later semesters, then alternate electives may be chosen from the set of elective courses offered under that category.

4. Assessment of Academic Performance

4.1 The performance of a student in a semester shall be evaluated course-wise for a maximum of 100 marks in each theory and practical course. In addition, industry-oriented project, seminar, and project work shall be evaluated for 100 marks each. The distribution of marks for CIE and the SEE along with the minimum pass percentage shall be as follows:

Course	CIE	SEE	Minimum academic requirements to pass a course	
			*Minimum Pass *Minimum Pass	
			Percentage (SEE)	Percentage (CIE+SEE)
Theory	40	60	40	50
Laboratory / Practical	50	50	40	50
Seminars	100	0	-	50
Project Work	50	100	50	50

^{*} Provided a relaxation of 10% of maximum marks shall be given to physically challenged students.

4.2 Each theory course in a semester is evaluated for 100 marks, out of which, there shall be CIE during a semester for 40 marks and SEE for 60 marks.

4.3 Continuous Internal Evaluation (CIE)

The CIE for Theory Courses has the following two components, comprising of 40 marks:

- a. Midterm Examinations 20 marks
- b. Assignment / Seminars / Projects / Group Activities / Quizzes 20 marks

a. Midterm Examinations:

There shall be two midterm examinations of 20 marks each. The average of the two examinations shall be taken as the marks secured by each candidate. Each midterm examination shall be conducted for the duration of 60 minutes and the question paper contains Part-A for 5 marks (consists of 5 short answers questions, each question carries one mark), and Part-B for 15 marks (consists of five long



answer questions of which a student has to answer three questions; each question carries 5 marks).

The first midterm examination shall be conducted for 2.5 units of syllabus at the end of 8 weeks of instruction and second midterm examination shall be conducted for remaining 2.5 units at the end of 16 weeks of instruction.

b. Assignment / Seminars / Projects / Group Activities / Quizzes / Class participation:

The faculty will evaluate the students for 20 marks by conducting any of the Assignment / Seminars / Projects / Group Activities / Quizzes / class participation in two phases covering at least two units in each phase. This should be completed before the conduct of second midterm examination.

4.4 Semester End Examination

- a. The semester end examination will be conducted for 60 marks. The question paper will consist of two parts viz., i) Part-A for 20 marks, ii) Part -B for 40 marks.
- b. Part-A is compulsory, which consists of ten questions (numbered from 1 to 10), two questions from each unit carrying 2 marks each.
- c. Part-B consists of five questions (numbered from 11 to 15), each question drawn from a separate unit of the syllabus and having an "either", "or" choice (that means there will be two questions from each unit and the student shall have to answer any one of them).

4.5 Practical Courses

- For practical courses, there shall be CIE during a semester for 50 marks and SEE for 50 marks.
- a. Out of the 50 marks for CIE, the breakup shall be as follows:
 - i. Preparation for Lab 10 marks
 - ii. Observation 10 marks
 - iii. Completion of Experiment 5 marks
 - iv. Record 5 marks
 - v. Skill Test 20 Marks
- b. Before the end of instruction, a Skill Test will be conducted for 20 marks.



- The practical SEE shall be conducted for 50 marks with an examiner along with the laboratory faculty member. The examiner shall be appointed by the Dean-Examinations of the University.
- 4.6 There shall be seminar presentations which will be evaluated under CIE for 100 marks. Students shall present a seminar before the faculty members assigned for the purpose.

4.7 **Project Work**

- There shall be a project work in 2nd year 2nd semester.
- Project work will be evaluated for 150 marks, out of which 50 marks as CIE and 100 marks as SEE. The CIE shall be based on two seminars given by each student on the topic of his/her project. The evaluation should be done by the PRC. The SEE (viva-voce) shall be conducted by the PRC consisting of (i) External examiner appointed by Dean (Examinations) on the recommendation of Chairperson-BOS, (ii) Head of the department, (iii) Supervisor of the project and (iv) a Senior faculty member of the department.
- 4.8 A candidate shall be given one chance to re-register for the courses if the internal marks secured by a candidate is less than 50% and failed in that course for maximum of two times. In the event of the student taking another chance, his / her CIE and SEE marks obtained in the previous attempt stands cancelled.
- 4.9 If there is a complaint in awarding the CIE marks, the University shall nominate a committee to look into the matter.
- 4.10 Candidates shall be permitted to apply for recounting/revaluation of SEE theory-scripts within the stipulated period with payment of prescribed fee.

4.11 Recounting:

The totaling of the marks awarded shall be verified in the answer script and corrected if there is any mistake.

4.12 Revaluation:

- a. The answer scripts of the candidate who applied for revaluation are evaluated by two subject experts independently other than the original evaluator.
- b. If the difference of marks between these two valuations is 15% or more, it will be sent for third valuation to another subject expert.



- c. Nearest of two valuations out of three will be considered and the average of these two will be taken as the final marks obtained.
- d. If the difference of the final marks after revaluation is >=15% of maximum marks, then the revaluation marks are considered for declaring the result.
- e. If the revaluation marks are less than the original marks, the original marks are retained and there is no change in the result.

4.13 Challenge Valuation:

The candidates who have applied for revaluation and are not satisfied with the result are only eligible to apply for challenge valuation by paying the prescribed fee in the form of DD payable to the Registrar, AU.

- a. On receipt of the DD, a photocopy of the answer booklet shall be given to the student.
- b. The paper will be evaluated in the presence of the student by a senior faculty member appointed by the University.
- c. If there is any change in the marks >= 15% of the maximum marks, the new marks will be awarded to the student. Otherwise, there will be no change in original secured marks.
- d. If the change in marks (equal or above 15% of the maximum marks) occurs, the amount paid towards challenge valuation will be refunded. Otherwise, the student will forfeit the total amount which he/she has paid.

5. The Grading System

5.1 As a measure of the student's performance, a 10-point Absolute Grading System using the following Letter Grades (UGC Guidelines) and Corresponding percentage of marks shall be followed:

% Of Marks Secured (Class Intervals)	Letter Grade (as per UGC Guidelines)	Grade Points
90% and above (≥ 90%, ≤ 100%)	O (Outstanding)	10
Below 90% but not less than 80% (≥ 80%, < 90%)	A+ (Excellent)	9
Below 80% but not less than 70% (≥ 70%, < 80%)	A (Very Good)	8
Below 70% but not less than 60% (≥ 60%, < 70%)	B+(Good)	7



Below 60% but not less than 50% (≥ 50%, < 60%)	B (Above Average)	6
Below 50% (< 50%)	F (Fail)	0
Absent	AB	0

- 5.2 In general, a student shall not be permitted to repeat any course(s) only for the sake of 'Grade Improvement' or 'SGPA/ CGPA improvement
- 5.3 The 'Credit Points' (CP) for a course, is computed by multiplying the Grade Point with Credits for that particular course.

Credit Points (CP) = Grade Point (GP) x Credits

- 5.4 The student passes the course only when he/she gets GP 6 (B Grade or above).
- 5.5 The Semester Grade Point Average (SGPA) is calculated as follows

$$SGPA = \frac{\{\sum_{i=1}^{N} \text{Ci Gi}\}}{\{\sum_{i=1}^{N} \text{Ci}\}}$$

where 'i' is the course indicator index (takes into account all courses in a semester), 'N' is the no. of courses registered for the Semester (as specifically required and listed under the Course Structure of the parent Department), C is the no. of Credits allotted to the ith course, and G represents the Grade Points (GP) corresponding to the Letter Grade awarded for that course.

5.6 The Cumulative Grade Point Average (CGPA) is a measure of the overall cumulative performance of a student over all semesters considered for registration. The CGPA is calculated as follows:

$$CGPA = \frac{\{\sum_{j=1}^{M} CjGj\}}{\{\sum_{j=1}^{M} Cj\}}$$

Where 'M' is the total no. of courses (as specifically required and listed under the course Structure of the parent Department) the student has registered from the 1st Semester onwards up to and inclusive of the Semester S (obviously M > N), 'j' is the course indicator index (takes into account all courses from 1 to S Semesters), C is the no. of credits allotted to the jth course, and G represents the Grade Points (GP) corresponding to the Letter Grade awarded for that jth course. After registration and completion of I Year I Semester however, the SGPA of that semester itself may be taken as the CGPA, as there are no cumulative effects.



5.7 For CGPA and SGPA calculations performance in failed courses (securing F Grade) will also be taken into account, and the Credits of such courses will also be included in the multiplications and summations.

6. Passing Standards:

- 6.1 A student shall be declared successful or 'passed' in a semester, only when he/she gets a SGPA ≥ 6.00 (at the end of that particular Semester); and a student shall be declared successful or 'passed' in the entire UGP, only when he/she gets a CGPA ≥ 6.00; subject to the condition that he/she secures a GP ≥ 6 (B Grade or above) in every registered course in each Semester
- 6.2 After the completion of each semester, a grade card or grade sheet (or transcript) shall be issued to all the registered students of that semester, indicating the letter grades and credits earned. It will show the details of the courses registered (course code, title, No. of credits, grade earned etc.), credits earned, SGPA and CGPA.

7. Evaluation of Project/Dissertation Work

Every candidate shall be required to submit a thesis or dissertation on a topic approved by the Project Review Committee.

- 7.1 A Project Review Committee (PRC) shall be constituted with Head of the Department as a Chairperson, Project Supervisor and two senior faculty members.
- 7.2 Registration of Project Work: A candidate is permitted to register for the project work after satisfying the attendance requirement of all the courses, both theory and practical.
- 7.3 After satisfying 7.2, a candidate has to submit, in consultation with his Project Supervisor, the title, objective and plan of action of his project work to the PRC for approval. Only after obtaining the approval of the PRC the student can initiate the Project work.
- 7.4 If a candidate wishes to change his supervisor or topic of the project, he/she can do so with the approval of the PRC. However, the PRC shall examine whether or not the change of topic/supervisor leads to a major change of his initial plans of project proposal. If yes, his date of registration for the project work starts from the date of change of Supervisor or topic as the case may be.



- 7.5 A candidate shall submit his/her project status report in two stages at least with a gap of one month between them.
- 7.6 The work on the project shall be initiated at the beginning of the II year II semester and the duration of the project is one semester. A candidate is permitted to submit Project Thesis only after successful completion of all theory and practical courses with the approval of PRC not earlier than 12 weeks from the date of registration of the project work. For the approval of PRC, the candidate shall submit the draft copy of thesis to the Head of the Department and make an oral presentation before the PRC.
- 7.7 Three copies of the Project Thesis certified by the supervisor shall be submitted to the University.
- 7.8 After approval from the PRC, a soft copy of the thesis should be submitted for PLAGIARISM check and the plagiarism report should be submitted to the examination branch and be included in the final thesis. The thesis will be accepted for submission, if the similarity index is less than 30%. If the similarity index has more than the required percentage, the student is advised to modify accordingly and re-submit the soft copy of the thesis after one month. The maximum number of re-submissions of thesis after plagiarism check is limited to TWO. The candidate has to register for the project work and work for two semesters. After two attempts, the admission is liable to be cancelled.
- 7.9 In II year II semester, the SEE for Project Work will be evaluated for 100 marks by an external examiner appointed by the University. The candidate has to secure minimum of 50% marks in Project Evaluation (Viva-Voce).
- 7.10 If he/she fails to fulfill the condition as specified in 7.9, he/she shall reappear for the Viva-Voce examination only after three months. In the reappeared examination also, fails to fulfill the above said condition, he/she will not be eligible for the award of the degree.
- 7.11 The thesis shall be adjudicated by one examiner appointed by the Dean-Examinations from the list of panel of examiners approved by the Vice- Chancellor. For this, Chairman, Board of Studies of the respective departments shall submit a panel of three examiners, who are eminent in that field with the help of the concerned guide and senior faculty of the department.



- 7.12 If the report of the examiner is unfavorable, the candidate shall revise and resubmit the Thesis. If the report of the examiner is unfavorable again, the thesis shall be summarily rejected.
- 7.13 If the report of the examiner is favorable, Project Viva-Voce examination shall be conducted by a board consisting of the Supervisor, Head of the Department and the external examiner who adjudicated the Thesis.
- 7.14 The Head of the Department shall coordinate and make arrangements for the conduct of Project Viva-Voce examination.

8. Award of Degree and Class

8.1 A Student who registers for all the specified courses as listed in the course structure, satisfies all the course requirements, and passes the examinations prescribed in the entire PG Program (PGP), and secures the required number of 68 Credits (with CGPA ≥ 6.0), shall be declared to have "QUALIFIED" for the award of the MCA Degree.

8.2 Award of Class

After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of MCA Degree, he/she shall be placed in one of the following three classes based on the CGPA:

CGPA	Class	Condition
≥8.00	First Class with Distinction	 Should have passed all the courses in 'first appearance' in a semester examination and should complete the program in two years of time. Should not have been detained or prevented from writing the end semester examinations in any semester due to shortage of attendance or any other reason. The students who secure CGPA≥8.00, but not fulfilling above conditions for "First Class with Distinction" shall be awarded "First Class" only.
≥6.75 - <8.00	First Class	
≥ 6.00 -< 6.75	Second class	



8.3 A student with final CGPA (at the end of the PGP) < 6.00 will not be eligible for the Award of Degree.

9. Withholding of Results

If the student has not paid the dues, if any, to the institution or if any case of indiscipline is pending against him/her, the result of the student will be withheld and he/she will not be allowed into the next semester. His/her degree will be withheld in such cases.

10. Transitory Regulations

- 10.1 Discontinued, detained or failed candidates are eligible for readmission / reregistration as and when offered next as per the University admission procedure.
- 10.2 The candidate who fails in any course has to complete the same course / equivalent course in the maximum stipulated time as per the Regulations in vogue.

11. Convocation

- 11.1 The University shall conduct convocation to confer the degree (s).
- 11.2 The University shall institute Prizes and Awards to meritorious students during convocation

12. Amendments

12.1 The regulations hereunder are subject to amendments as may be made by Academic Council from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already undergoing the program)



ANNEXURE - I: Disciplinary Action against Students - Provisions

- A. Student's behavior and discipline will be assessed and will receive the same attention as the academic work. Discipline includes the observance of good conduct and orderly behavior by the students of the University;
- B. All students pursuing a Program at the University shall observe code of conduct and maintain discipline and must consider it as a duty to behave decently at all places;
- C. Every student shall always carry the Identity card issued by the university. Every student shall have to produce or surrender the identity card, as and when required by the proctorial staff, teaching and library staff and the officials of the university. The loss of the identity card, whenever it occurs, shall immediately be reported in writing to the Registrar.
- D. Any violation of the code of conduct or breach of any rules and regulations of the university is construed as an act of indiscipline and shall make him/her liable for disciplinary action;
- E. The following acts are treated as gross indiscipline:
 - Disobeying the teacher/officials or misbehaving in the class;
 - Quarrelling or fighting in the University campus, hostels amongst themselves, indulging in any activity which amounts to ragging or Harassment of other students;
 - Quarrelling or fighting with a university employee(s) or any other public utility functionaries in the campus;
 - Indecent behavior in the University campus or outside causing inconvenience to others;
 - Visiting socially unacceptable websites, smoking or consuming liquor or banned substances like drugs etc.;
 - Damage to the University property;
 - Indulging in acts of theft, forgery, stealing and misappropriating;
 - · Any other activity that defames the University;
 - Use of mobile in the class/academic area.
 - Irregularity in attending classes, persistent idleness, negligence or indifference towards the work assigned;
 - Any other conduct which is considered to be unbecoming of a student.
- F. Rules for Students Conduct & Behavior in Campus and Outside;
- G. The rules and regulations, academic calendar shall be provided to all the students



H. In general, Dean, Student Affairs will deal with the welfare and discipline of all students in the campus including Hostel and also outside the campus and will ensure maintenance of good conduct. He/ She will be assisted by other members of faculty/ staff/ wardens as nominated;

I. Conduct and Behavior:

- Students should attend all their classes and strictly observe class timings. They should likewise carry out other out-door and extracurricular duties assigned to them. Their attendance and leave is governed by the regulations pertaining to them;
- ii. Students must give their undivided attention to their academic work and must be respectful to their teachers and supervisors;
- iii. Students must conduct themselves with due decorum in the classes, laboratories, Library etc. and move in an orderly and disciplined manner in the campus;
- iv. Students should not indulge in abusive behavior/ violence of any kind with fellow students, teaching faculty and employees of the University within or outside the University. Violence by any student or group of students will lead to severe disciplinary action;
- v. No meeting of the students other than those organized under the aegis of the various recognized students' activities shall be called without the prior permission in writing from the Dean, Student Affairs;
- vi. Neither meetings/functions within the University campus shall be organized nor any outsider address the students without the prior permission in writing from the Registrar;
- vii. No students shall use unfair means at any of the examinations and tests or attempt or threaten the staff to get undue advantage;
- viii. Students must pay all fees and other dues on specified dates. If they do not do so, they render themselves liable to penalties as in force from time to time;
- ix. Students must take good care of all University property. Any damage to university property shall be viewed as indiscipline. Such student(s), in addition to facing the disciplinary action, shall have to replace the damaged property and make good the losses caused due to their action. Students must use the furniture and fittings with



- due care and must not deface buildings, roads, furniture and fittings etc. in any manner:
- x. Students must handle the laboratory equipment, instruments and machinery with great care. Any damage or breakage of such equipment etc., due to improper use are negligent handling will have to be made good by the students concerned;
- xi. Ragging in any form is unlawful and strictly prohibited. If a student found ragging shall be punished as per the Anti-Ragging Act;
- xii. The University shall have a zero-tolerance policy towards Ragging and shall lay down strict guidelines on the same as per policies of the UGC in vogue and in compliance to directions of Hon'ble Supreme Court;
- xiii. Mobile cellular phone may be carried by the students. However, they shall be kept in silent mode during the classes. Violation will lead to confiscation of the mobile phone:
- xiv. All the students are required to observe the decorum in the dress code as prescribed by the University. Students not adhering to the prescribed dress code may be denied entry to the University campus;
- xv. Smoking, consumption/possession of liquor, intoxicants, drugs, cigarettes, hookah etc., inside or outside the Campus is strictly prohibited. Any violation will invoke severe penalty including rustication from the Hostel/ University.

J. Policy to prevent Sexual Harassment:

- i. The University shall be committed to treating every employee and student with dignity and respect. It shall seek to create a work environment that is free from sexual harassment of any kind, whether verbal, physical or visual;
- ii. A policy shall be prescribed by the University to provide guidelines for prompt redressal of complaints related to sexual harassment which should be in full compliance with "The Sexual Harassment of Women at Workplace (Prevention, Prohibition & Redressal)" Act, 2013;
- iii. All references / complaints and redressal mechanism pertaining to any matter will be handled within the ambit of the said Act and the Rules framed thereunder. The policy so prescribed shall be communicated to all employees and students.

K. Grievance and Redressal Mechanisms:

The University shall constitute various Grievance and Redressal committees and its guidelines as specified by the statutory authorities of the University.



ANNEXURE – II: Malpractice Rules

S. No	Nature of Malpractice	Punishment
	(Improper conduct during examinations)	
	If the candidate:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he/she is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he/she will be handed over to the police and a case is registered against him/her.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that

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	practical) in which the candidate disappearing.	Semester/year. The hall ticket of the candidate is to be cancelled.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate, who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all Semester end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he/she will be handed over to the police and a case is registered against him/her.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination. Takes away answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all SEEs. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner	Cancellation of the performance in that subject.



requesting him to award pass marks 6. Refuses to obey the orders of the They shall be expelled from examination Chief Superintendent / Assistant halls and cancellation of their performance Superintendent / any officer on in that subject and all other subjects the duty or misbehaves or creates candidate(s) has (have) already appeared disturbance of any kind in and and shall not be permitted to appear for the around the examination hall or remaining examinations of the subjects of organizes a walk out or instigates that semester/year. The candidates also are others to walk out, or threatens the debarred and forfeit their seats. In case of officer-in charge or any person on outsiders, they will be handed over to the duty inside or outside police and a police case will be registered examination hall or causing any against them. injury to himself / herself or to any others or threatens whether by words, either spoken or written or visible by signs or by representation, assaults the officer in-charge, or any person on duty in or outside the examination hall or any others, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the college campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.

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7.	Leaves the exam hall taking away answer script or intentionally tears the script or any part-thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work & shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all Semester examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits these at.
9.	Who is not a candidate for the particular examination or any person not connected with the University indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the University will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical



		examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11.	Found copying, on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.		is not covered in the above clauses 1 to 11 committee for further action on suitable

ANNEXURE -III: Definitions

In these Regulations, unless the context otherwise requires:

- a. Academic Year: Two consecutive (one odd + one even) semesters constitute one academic year
- b. Choice Based Credit System (CBCS): The CBCS provides choice for students to select from the prescribed courses (core, elective or minor or soft skill courses)
- c. Course: Usually referred to, as a 'course' is a component of a program. All courses need not carry the same weightage. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/tutorials/laboratory work / field work / outreach activities / project work/vocational training / viva / seminars / term papers / assignments / presentations / self- study etc., or a combination of some of these
- d. Credit Based Semester System (CBSS): Under the CBSS, the requirement for awarding a degree or diploma or certificate is prescribed in terms of number of credits to be completed by the students
- e. 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
- f. Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale
- g. Credit Point: It is the product of grade point and number of credits for a course



- h. Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters i.e., O, A+, A, B+, B, C and F
- i. Semester Grade Point Average (SGPA): It is a measure of academic performance in a semester. It is the ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places
- j. Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student. The CGPA is the ratio of total credit points secured by a student in all semesters and the sum of the total credits. It shall be expressed up to two decimal places
- k. Program: An academic program of the University
- I. Semester: Each semester shall consist of 16 weeks of instruction.
- m. Transcript or Grade Card or Certificate: Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester
- n. Types of courses: The courses in a program may be of three kinds: Core, Elective and Foundation
- o. Core course: This is the course which is to be compulsorily studied by a student as a core requirement of a program in a branch of study
- p. Elective course: This is the course to be chosen from a pool of courses. Elective course may be (a) Supportive to the branch of study (b) Providing an expanded scope (c) Enabling an exposure to some other branch/domain (d) Nurturing student's proficiency/skill
- q. Foundation course: This course may be of two kinds, compulsory foundation and elective foundation
- r. Compulsory Foundation courses: These are the courses based upon the content that leads to knowledge enhancement. They are mandatory for all disciplines
- s. Elective Foundation courses: These are value-based and are aimed at man-making education
- t. The academic regulations should be read as a whole for the purpose of any interpretation.
- u. In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Chancellor is final.



Item 7:

Approval of the 1st Year Course Structure of the MCA program



Minutes of the Fifth Board of Studies (BoS) meeting

The fifth Board of Studies (BoS) Meeting of the Department of Computer Science and Engineering (CSE), Anurag University was held on Monday, 25th July 2022 from 3.15 p.m. in virtual mode. The internal BoS members, the senior and doctorate faculty, and the course coordinators of the CSE Department also participated in the meeting.

The link for the meeting.

https://us02web.zoom.us/j/86091289037?pwd=VkNmYmN4aXBqem5WeWhnYjZwK0ozQT09 Meeting ID: 860 9128 9037

Passcode: 889303

Agenda of the Meeting:

- 1. To review the eligibility criteria for the Two-year Master of ComputerApplication (MCA) program
- 2. To review and finalize the First year (1^{st} and 2^{nd} semester) Course structure and syllabus of the MCA program
- 3. To review the tentative course structure for 2nd year MCA Program
- 4. Introduction of Ph. D. Program in Computer science Application for MCA. and M.Sc. Computer Science/ Information Technology/ Data science/ Degree holders
- 5. Any other item with the permission of the chair

The Chairperson, of BoS, has communicated the tentative course structure and syllabus of the program well in advance to all the members of BoS: The Chairperson has welcomed the members and conducted the proceedings. The following Resolutions were made in the meeting.



Item No. 1: To review the Eligibility Criteria for the MCA program

Resolution: The Chairperson BoS has presented the eligibility criteria of two years MCA program at AU and also of AICTE norms: The members resolved the following eligibility criteria:

Students who have passed the Bachelor's Degree examination of any University recognized by Anurag University with a minimum three years duration with at least 50% marks (45% marks in case of SC/ST/BC categories) in the qualifying examination with Mathematics at 10+2 level or graduation level.

Any B.E./B.Tech. from a recognized University Phstitution with at least 50% marks (45% marks in case of SC/ST/BC categories).

The candidates qualified in TS-ICET/AP-ICET MT MCA Common EntranceTest (NIMCET), or any other National level test recognized by Anurag University

Item No. 2: To review and finalize the First year Course structure and syllabus of the MCA program

Resolution: The BoS members had an elaborate discussion on the Course structure of the First year first and second semester of MCA and suggested the following modifications:

- a. The BoS members have suggested a few changes in the tentative course structure presented by Chairperson BoS: The Members felt that it will be difficult for students to grasp the two programming languages in the first semester; it is resolved to place Python programming in the first year secondsemester.
- b. The BoS members resolved to introduce some soft skills lab in the FirstSemester of the First year. And the same is resolved.
- c. The syllabus of the First year first and second semesters are approved.
- d. In any case, if there are minor changes or amendments either in the course structure or syllabus, they will be communicated to all BOS members throughe-mail for eapproval.



Item No. 3: To review the tentative course structure for 2nd year MCA Program

Resolution: The BoS members had an elaborate discussion on the Course Structure of the III& IV semesters of the MCA Program and suggested the following:

- a. Asked to think of clubbing the DAA course with any other subjects by considering the important topics of DAA. The same was approved.
- b. Asked to conduct one more meeting for the finalization of 2nd year MCA course structure and syllabus.

Item No. 4: Introduction of Ph. D. Program in Computer science Application for MCA. and M.Sc. Computer Science/ Information Technology/ Data science/ Degree holders

Resolution: The Chairperson BoS placed before members, that many applicants with MCA and MSc Computer Science are applying for Ph.D. in CSE, and as per the present AU-Ph.D. rules and regulations, they are not applicable without M.Tech in CSE. The members agreed and resolved to consider the MCA. and M.Sc. Computer Science/ Information Technology/ Data science/ Degree holders for Ph.D. in Computer science Application program. The other rules will be applicable as per the current AU Ph.D. rules and regulations.

Item No. 5: Consideration of industry-oriented course

Resolution: the members appreciated this and resolved to place industry-oriented courses in professional Electives, as and when the resources are available from the industry.

The Meeting was concluded by a Vote of thanks.



The following members have attended the meeting

S.No	Name	Designation	Designation in
			BoS
1	Dr. R.B.V. Subramanyam	Professor, Dept. of CSE, and Chief	External Member
		Investigator, Electronics & ICT Academy (Set	
		up by MeitY, Govt. of India), NIT, Warangal	
2	Dr. Rajiv Wankar	Professor, Dept. of CSE, University	External Member
		ofHyderabad	
3	Ms. SravanthiSatyavarapu	Manager, Tech. Mahindra,	Alumni
		Hyderabad	
4	Dr. G. Vishnu Murthy	Professor & Dean-Engineering,	Internal Member
		AU	
5	Dr. Sandeep Singh Rawat	Head, and Professor	Internal Member
6	Dr.M. Sridevi	Associate Professor, CSE	Internal Member
		·	
7	Mrs V. Jyothi	Asst. Professor, CSE	Internal Member
8	Dr. V. Vijaya Kumar	Professor and Dean, R & D	Internal Member

Member Invitee

S.No	Name	Designation	Designation in BoS
1	Dr.K.Sudheer Reddy	Head Dept.of IT	Member Invitee
2	Dr.A.Mallikarjun Reddy	Assoc., Prof., Dept of CSE	Member Invitee
3	Dr.P.Srilatha	Asst., Prof., Dept of CSE	Member Invitee
4	Dr. G.Bala Krishna	Asst., Prof., Dept of CSE	Member Invitee
5	Dr. Pallam Ravi	Asst., Prof., Dept of IT	Member Invitee
6	Ms.N.Swapna goud	Asst., Prof., Dept of CSE	Member Invitee
7	Mr.G.Balram	Asst., Prof., Dept of CSE	Member Invitee
8.	Mr. P.Raja Sekhar	Asst., Prof., Dept of CSE	Member Invitee

Sd/

Chairperson Board of Studies

Department of Computer Science and Engineering, Anurag

University, HyderabadFifth BOS-MoM-CSE-AU-25th July -2022





Computer Science and Engineering

Master of Computer Applications (MCA)

(2- Year Program)

Course Structure

with effect from the Academic Year 2022 - 2023



SEMESTER-I

SNo	Course Code	CourseTitle	ourseTitle Hours/Wee				ne of inatio	No of Credits	
							Max I	Marks	
THE	ORY		L	Т	P	CIE	SEE	Total Marks	
1		Mathematical Foundationsof Computer Science	2	1	-	40	60	100	3
2		C Programming	3	-	-	40	60	100	3
3		Python Programming	3	-	-	40	60	100	3
4		Computer Organization	2	-	-	40	60	100	2
5		Probability and Statistics	2	1	-	40	60	100	3
6		Principles of Management	2	-	-	40	60	100	2
	I.	PRACTICALS		ı					•
7		C Programming Lab	-	-	3	50	50	100	1.5
8		Python Programming Lab	-	-	3	50	50	100	1.5
9		Skill Integrated Lab	-	-	2	50	50	100	1
			14	2	8	390	510	900	20



SEMESTER - II

SNo	Course Code	Course Title	_	Hours Week	•	Schem Exami	No of Credits		
THEORY			L	T	P	CIE	SEE	Total Marks	
1		Object oriented programming through Java	3	1	-	40	60	100	3
2		Data Structures	3	-	-	40	60	100	3
3		Database Management Systems	3	-	-	40	60	100	3
4		Operating Systems	2	-	-	40	60	100	2
5		Software Engineering	2	1		40	60	100	3
1]	PRACTICALS				1			
6		Data Structures and Object oriented programming through Java Lab	-	-	3	50	50	100	1.5
7		Database Management Systems	-	-	3	50	50	100	1.5
8		Quantitative Aptitude and Reasoning	-	-	3	50	50	100	1.5
9		Design Thinking Lab			3	50	50	100	1.5
11		Summer Internship*	-	-	-				-
			13	1	12	400	500	900	20

^{*}Summer Internship: After second semester, students shall do summer internship and whose evaluation will be done in the third semester.



SEMESTER-III

SNo	Course CourseTitle			Hours/ Week			eme o	No of	
				1		-	ax Ma	Credits	
		THEORY	L	T	P	CIE	SEE	Total	
1		Design and Analysis of Algorithms	3	-	-	40	60	100	3
2		Internet and Web Technologies	3	-	-	40	60	100	3
3		Data Science	3	-	1	40	60	100	3
4		Mobile Application Development	2	-	-	40	60	100	2
5		Professional Elective–I	3	-	-	40	60	100	3
6		Information Security	2	-	-	40	60	100	2
11.	PR	RACTICALS							
7		Mobile Application Development Lab	-	-	3	50	50	100	1.5
8		Internet and Web Technologies Lab	-	-	3	50	50	100	1.5
9		Data Science Lab	-	-	3	50	50	100	1.5
10		Summer Internship	_	-	-				1.5
			16	-	9	390	510	900	22

Professional Electives

Professional Elective -1							
Artificial Intelligence							
Machine Learning							
Cloud Computing							
Internet of Things							
Operations Research							
Software Quality Testing							



SEMESTER-IV

SNo	Course Code	CourseTitle	Hou We		Scheme of Examination Max Marks			No of Credits
THEORY			L	P	CIE	SEE	Total	
1	PEC	Professional Elective –II	3	_	40	60	100	3
2	OE	Open Elective	3	-	40	60	100	3
PRAC	PRACTICALS							
3	PW	Project Work	-	24	50	100	150	12
		Total	6	24	130	220	350	18

Profes	Professional Elective – II						
1.	Optimization Techniques						
2.	Big Data Analytics						
3.	Research Methodologies						
4.	Deep Learning						
5.	Block Chain Technologies						
6.	Natural Language Processing						

Open Elective

- English for Professionals
 Essential English and Employability Skills
- 3. Negotiation Skills
- 4. Project Management5. Environmental Science



Item 8:

Approval of the amendment to the 1st year B. Tech course structure and 2nd year mandatory courses to balance the teaching load



Approval of the amendment to the 1st year B. Tech course structure and 2nd year mandatory courses to balance the teaching load

- a. The reorganization of 1st year B. Tech course structure is proposed to balance the teaching load.
- b. The programs are divided into two groups namely, Group A and Group B.

GROUP - A

1. 2. 3.	Computer Science and Engineering Computer Science and Engineering (Data Science) Electronics and Communication Engineering	- 12 - 04	- 04
GROU	 IP – B		20
2. 3. 4. 5. 6.	, in this case is the same of	') - 04 - 04	- 04 - 04 - 02 - 01 - 01
			20

GROUP A: CSE, CSE (DS) & ECE

	I-Semester	II-Semester
S. No	Name of the Course	Name of the Course
1	Mathematics-I	Mathematics-II
2	Engineering Chemistry	Applied Physics
3 Programming and Problem Programming and Prog		Programming and Problem Solving-II
4	English	Basic Electrical Engineering
5.	Engineering Graphics Lab	Applied Physics Lab
6	English Language Skill Lab	Programming and Problem Solving-II Lab
7	Engineering Chemistry Lab	Basic Electrical Engineering Lab
8	Programming and Problem Solving-I Lab	Engineering Workshop
9		English Communication Skills Lab
Total Credits	18.5	19.5



GROUP B: CSE(CS), AI, AIML, EEE, ME, CE, IT

	I- Semester	II- Semester
S. No	Name of the Course	Name of the Course
1	Mathematics-I	Mathematics-II
2	Applied Physics / Engineering	Engineering Chemistry
	Physics	
3	Programming and Problem Solving-I	Programming and Problem Solving-II
4	Basic Electrical	English
	Engineering/Electrical Circuits/	
	Engineering Mechanics	
5.	Applied Physics Lab / Engineering	Engineering Graphics Lab /
	Physics Lab	Engineering Graphics (Theory)
6	Programming and Problem Solving-I	English Language Skill Lab
	Lab	
7	Basic Electrical Engineering Lab /	Engineering Chemistry Lab
	Electrical Circuits Lab	
8	Engineering Workshop	Programming and Problem Solving-II
		Lab
9	English Communication Skills Lab	
Total	19.5	18.5
Credits	19.3	10.3

Programs in which course structure	Programs in which course
remains unchanged	structure is reorganized
Artificial Intelligence	Computer Science and Engineering
Artificial Intelligence & Machine Learning	Data Science
Cyber Security	Civil Engineering
Information Technology	Electrical and Electronics Engineering
Electronics and Communication Engineering	Mechanical Engineering

c. The reorganization of 2nd year mandatory courses is proposed to balance the teaching load.

It is proposed to swap two mandatory courses (Gender Sensitization and Environmental Studies) of the Computer Science and Engineering department to balance the load.



ARTIFICIAL INTELLIGENCE

I YEAR I SEMESTER

COURSE STRUCTURE

C N -	Comme Code	C T241-	Hou	Credits		
S.No.	Course Code	Course Title		T	P	Credits
1	A51001	Mathematics-I	3	1	0	4.0
2	A51006	Applied Physics	3	1	0	4.0
3	A51004	Programming for Problem Solving- I	2	0	0	2.0
4	A51007	Basic Electrical Engineering	3	0	0	3.0
5	A51222	Applied Physics Lab	0	0	3	1.5
6	A51223	Programming for Problem Solving-I Lab	0	0	3	1.5
7	A51224	Basic Electrical Engineering Lab	0	0	2	1.0
8	A51225	Engineering Workshop	0	0	3	1.5
9	A51226	English Communication Skills Lab	0	0	2	1.0
	TOTAL			02	13	19.5

I YEAR II SEMESTER

G 3.1	~ ~ .	G	Hours	G 111		
S.No.	Course Code	Course Title		T	P	Credits
1	A52001	Mathematics-II	3	1	0	4.0
2	A52008	English	2	0	0	2.0
3	A52009	Engineering Chemistry	3	1	0	4.0
4	A52003	Programming for Problem Solving-II	2	0	0	2.0
5	A52221	Engineering Graphics Lab	1	0	3	2.5
6	A52222	English Language Skills Lab	0	0	2	1.0
7	A52223	Engineering Chemistry Lab	0	0	3	1.5
8	A52224	Programming for Problem Solving – II Lab	0	0	3	1.5
	TOTAL			2	11	18.5



ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

I YEAR I SEMESTER

COURSE STRUCTURE

C N -	Comme Code	C T241-	Hou	rs per v	veek	Credits
S.No.	Course Code	Course Title	L	T	P	Creatts
1	A51001	Mathematics-I	3	1	0	4.0
2	A51006	Applied Physics	3	1	0	4.0
3	A51004	Programming for Problem Solving- I	2	0	0	2.0
4	A51007	Basic Electrical Engineering	3	0	0	3.0
5	A51227	Applied Physics Lab	0	0	3	1.5
6	A51228	Programming for Problem Solving-I Lab	0	0	3	1.5
7	A51229	Basic Electrical Engineering Lab	0	0	2	1.0
8	A51230	Engineering Workshop	0	0	3	1.5
9	A51231	English Communication Skills Lab	0	0	2	1.0
	TOTAL			02	13	19.5

I YEAR II SEMESTER

G 3.7			Hours	per w	eek	Cuadita
S.No.	Course Code	Course Title	L	T	P	Credits
1	A52001	Mathematics-II	3	1	0	4.0
2	A52008	English	2	0	0	2.0
3	A52009	Engineering Chemistry	3	1	0	4.0
4	A52003	Programming for Problem Solving-II	2	0	0	2.0
5	A52225	Engineering Graphics Lab	1	0	3	2.5
6	A52226	English Language Skills Lab	0	0	2	1.0
7	A52227	Engineering Chemistry Lab	0	0	3	1.5
8	A52228	Programming for Problem Solving – II Lab	0	0	3	1.5
	TOTAL			2	11	18.5



CIVIL ENGINEERING

I YEAR I SEMESTER

COURSE STRUCTURE

G 3.1		G	Hours	per w	eek	Credits
S.No.	Course Code	Course Title	L	T	P	Credits
1	A51001	Mathematics-I	3	1	0	4.0
2	A51002	Engineering Physics	3	1	0	4.0
3	A51003	Engineering Mechanics	3	1	0	4.0
4	A51004	Programming for Problem Solving-I	2	0	0	2.0
5	A51201	Engineering Physics Lab	0	0	3	1.5
6	A51202	Engineering Workshop	0	0	3	1.5
7	A51203	Programming for Problem Solving – I Lab	0	0	3	1.5
8	A51204	English Communication Skills Lab	0	0	2	1.0
	TOTAL			3	11	19.5

I YEAR II SEMESTER

C No	Course Code C	Course Title	Course Title Hou		veek	Credits
S.No.	Course Code	Course Title	L	T	P	Credits
1	A52001	Mathematics-II	3	1	0	4.0
2	A52008	English	2	0	0	2.0
3	A52009	Engineering Chemistry	3	1	0	4.0
4	A52003	Programming for Problem Solving- II	2	0	0	2.0
5	A52011	Engineering Graphics	1	0	3	2.5
6	A52201	English Language Skills Lab	0	0	2	1.0
7	A52202	Engineering Chemistry Lab	0	0	3	1.5
8	A52203	Programming for Problem Solving-II Lab	0	0	3	1.5
TOTAL			11	02	11	18.5



COMPUTER SCIECNCE AND ENGINEERING

I YEAR I SEMESTER

COURSE STRUCTURE

G N			Hours	eek	Cnodita	
S.No.	Course Code	Course Title	L	T	P	Credits
1	A51001	Mathematics-I	3	1	0	4.0
2	A51002	English	2	0	0	2.0
3	A51003	Engineering Chemistry	3	1	0	4.0
4	A51004	Programming for Problem Solving-I	2	0	0	2.0
5	A51218	Engineering Graphics Lab	1	0	3	2.5
6	A51219	English Language Skills Lab	0	0	2	1.0
7	A51220	Engineering Chemistry Lab	0	0	3	1.5
8	A51221	Programming for Problem Solving – I Lab	0	0	3	1.5
	TOTAL			2	11	18.5

I YEAR II SEMESTER

C NI-	Course Code	Course Title	Hou	rs per v	week	Credits
S.No.	Course Code	Course Tide	L	T	P	Creatts
1	A52001	Mathematics-II	3	1	0	4.0
2	A52005	Applied Physics	3	1	0	4.0
3	A52003	Programming for Problem Solving- II	2	0	0	2.0
4	A52007	Basic Electrical Engineering	3	0	0	3.0
5	A52216	Applied Physics Lab	0	0	3	1.5
6	A52217	Programming for Problem Solving-II Lab	0	0	3	1.5
7	A52218	Basic Electrical Engineering Lab	0	0	2	1.0
8	A52219	Engineering Workshop	0	0	3	1.5
9	A52220	English Communication Skills Lab	0	0	2	1.0
TOTAL			11	02	13	19.5



COMPUTER SCIECNCE AND ENGINEERING (CS)

I YEAR I SEMESTER

COURSE STRUCTURE

C.N.	Comme Code	C	Hou	rs per v	week	Credits
S.No.	Course Code	Course Title	L	T	P	Credits
1	A51001	Mathematics-I	3	1	0	4.0
2	A51006	Applied Physics	3	1	0	4.0
3	A51004	Programming for Problem Solving- I	2	0	0	2.0
4	A51007	Basic Electrical Engineering	3	0	0	3.0
5	A51232	Applied Physics Lab	0	0	3	1.5
6	A51233	Programming for Problem Solving-I Lab	0	0	3	1.5
7	A51234	Basic Electrical Engineering Lab	0	0	2	1.0
8	A51235	Engineering Workshop	0	0	3	1.5
9	A51236	English Communication Skills Lab	0	0	2	1.0
TOTAL			11	02	13	19.5

I YEAR II SEMESTER

G N		G THU	Hours	per w	eek	Credits
S.No.	Course Code	Course Title	L	T	P	
1	A52001	Mathematics-II	3	1	0	4.0
2	A52008	English	2	0	0	2.0
3	A52009	Engineering Chemistry	3	1	0	4.0
4	A52003	Programming for Problem Solving-II	2	0	0	2.0
5	A52229	Engineering Graphics Lab	1	0	3	2.5
6	A52230	English Language Skills Lab	0	0	2	1.0
7	A52231	Engineering Chemistry Lab	0	0	3	1.5
8	A52232	Programming for Problem Solving – II Lab	0	0	3	1.5
	TOTAL			2	11	18.5



COMPUTER SCIECNCE AND ENGINEERING (DS)

I YEAR I SEMESTER

COURSE STRUCTURE

			Hours	eek	Credits	
S.No.	Course Code	Course Title	L	T	P	Credits
1	A51001	Mathematics-I	3	1	0	4.0
2	A51002	English	2	0	0	2.0
3	A51003	Engineering Chemistry	3	1	0	4.0
4	A51004	Programming for Problem Solving-I	2	0	0	2.0
5	A51237	Engineering Graphics Lab	1	0	3	2.5
6	A51238	English Language Skills Lab	0	0	2	1.0
7	A51239	Engineering Chemistry Lab	0	0	3	1.5
8	A51240	Programming for Problem Solving – I Lab	0	0	3	1.5
	TOTAL			2	11	18.5

I YEAR II SEMESTER

C No	Course Code	Course Title	Hou	rs per v	week	Credits
S.No.	Course Code	Course Title	L	T	P	Credits
1	A52001	Mathematics-II	3	1	0	4.0
2	A52005	Applied Physics	3	1	0	4.0
3	A52003	Programming for Problem Solving- II	2	0	0	2.0
4	A52007	Basic Electrical Engineering	3	0	0	3.0
5	A52233	Applied Physics Lab	0	0	3	1.5
6	A52234	Programming for Problem Solving-II Lab	0	0	3	1.5
7	A52235	Basic Electrical Engineering Lab	0	0	2	1.0
8	A52236	Engineering Workshop	0	0	3	1.5
9	A52237	English Communication Skills Lab	0	0	2	1.0
TOTAL			11	02	13	19.5



ELECTRONICS AND COMMUNICATION ENGINEERING

I YEAR I SEMESTER

COURSE STRUCTURE

C No	Course Code	Course Title	Hou	rs per v	veek	Credits
S.No.	Course Code	Course Title	L	T	P	Credits
1	A51001	Mathematics-I	3	1	0	4.0
2	A51002	English	2	0	0	2.0
3	A51003	Engineering Chemistry	3	1	0	4.0
4	A51004	Programming for Problem Solving- I	2	0	0	2.0
5	A51214	Engineering Graphics Lab	1	0	3	2.5
6	A51215	English Language Skills Lab	0	0	2	1.0
7	A51216	Engineering Chemistry Lab	0	0	3	1.5
8	A51217	Programming for Problem Solving-I Lab	0	0	3	1.5
	TOTAL			02	11	18.5

I YEAR II SEMESTER

		Course Title	Hours	per w	eek	Credita
S.No.	Course Code		L	Т	P	Credits
1	A52001	Mathematics-II	3	1	0	4.0
2	A52005	Applied Physics	3	1	0	4.0
3	A52003	Programming for Problem Solving-II	2	0	0	2.0
4	A52007	Basic Electrical Engineering	3	0	0	3.0
5	A52211	Applied Physics Lab	0	0	3	1.5
6	A52212	Programming for Problem Solving – II Lab	0	0	3	1.5
7	A52213	Basic Electrical Engineering Lab	0	0	2	1.0
8	A52214	Engineering Workshop	0	0	3	1.5
9	A52215	English Communication Skills Lab	0	0	2	1.0
	TOTAL			2	13	19.5



ELECTRICAL AND ELECTRONICS ENGINEERING

I YEAR I SEMESTER

COURSE STRUCTURE

	Course		Hours	eek		
S.No.	Code	Course Title	L	T	P	Credits
1	A51001	Mathematics-I	3	1	0	4.0
2	A51006	Applied Physics	3	1	0	4.0
3	A51004	Programming for Problem Solving-I	2	0	0	2.0
4	A51005	Electrical Circuits	3	0	0	3.0
5	A52105	Applied Physics Lab	0	0	3	1.5
6	A52106	Programming for Problem Solving – I Lab	0	0	3	1.5
7	A52107	Electrical Circuits Lab	0	0	2	1.0
8	A52108	Engineering Workshop	0	0	3	1.5
9	A52109	English Communication Skills Lab	0	0	2	1.0
		TOTAL	11	2	13	19.5

I YEAR II SEMESTER

C N -	Comme Code	Course Title		rs per v	veek	Cradita	
S.No.	Course Code	Course Title	L	T	P	Credits	
1	A52001	Mathematics-II	3	1	0	4.0	
2	A52008	English	2	0	0	2.0	
3	A52009	Engineering Chemistry	3	1	0	4.0	
4	A52003	Programming for Problem Solving- II	2	0	0	2.0	
5	A52204	Engineering Graphics Lab	1	0	3	2.5	
6	A52205	English Language Skills Lab	0	0	2	1.0	
7	A52206	Programming for Problem Solving-II Lab	0	0	3	1.5	
8	A52207	Engineering Chemistry Lab	0	0	3	1.5	
		11	02	11	18.5		



INFORMATION TECHNOLOGY

I YEAR I SEMESTER

COURSE STRUCTURE

C N-	Commo Codo	C T-41-	Hou	rs per v	veek	Credita
S.No.	Course Code	Course Title	L	T	P	Credits
1	A51001	Mathematics-I	3	1	0	4.0
2	A51006	Applied Physics	3	1	0	4.0
3	A51004	Programming for Problem Solving- I	2	0	0	2.0
4	A51007	Basic Electrical Engineering	3	0	0	3.0
5	A51241	Applied Physics Lab	0	0	3	1.5
6	A51242	Programming for Problem Solving-I Lab	0	0	3	1.5
7	A51243	Basic Electrical Engineering Lab	0	0	2	1.0
8	A51244	Engineering Workshop	0	0	3	1.5
9	A51245	English Communication Skills Lab	0	0	2	1.0
		11	02	13	19.5	

I YEAR II SEMESTER

G 27			Hours	eek		
S.No.	Course Code	Course Title	L	T	P	Credits
1	A52001	Mathematics-II	3	1	0	4.0
2	A52008	English	2	0	0	2.0
3	A52009	Engineering Chemistry	3	1	0	4.0
4	A52003	Programming for Problem Solving-II	2	0	0	2.0
5	A52238	Engineering Graphics Lab	1	0	3	2.5
6	A52239	English Language Skills Lab	0	0	2	1.0
7	A52240	Engineering Chemistry Lab	0	0	3	1.5
8	A52241	Programming for Problem Solving – II Lab	0	0	3	1.5
		11	2	11	18.5	



MECHANICAL ENGINEERING

I YEAR I SEMESTER

COURSE STRUCTURE

~			Hours	Hours per week				
S.No.	Course Code	Course Title	L	Т	P	Credits		
1	A51001	Mathematics-I	3	1	0	4.0		
2	A51002	Engineering Physics	3	1	0	4.0		
3	A51003	Engineering Mechanics	3	1	0	4.0		
4	A51004	Programming for Problem Solving-I	2	0	0	2.0		
5	A51210	Engineering Physics Lab	0	0	3	1.5		
6	A51211	Engineering Workshop	0	0	3	1.5		
7	A51212	Programming for Problem Solving – I Lab	0	0	3	1.5		
8	A51213	English Communication Skills Lab	0	0	2	1.0		
		11	3	11	19.5			

I YEAR II SEMESTER

CNo	Course Code	Course Title		rs per v	veek	Crodita
S.No.	Course Code	Course Title	L	T	P	Credits
1	A52001	Mathematics-II	3	1	0	4.0
2	A52008	English	2	0	0	2.0
3	A52009	Engineering Chemistry	3	1	0	4.0
4	A52003	Programming for Problem Solving- II	2	0	0	2.0
5	A52011	Engineering Graphics	1	0	3	2.5
6	A52208	English Language Skills Lab	0	0	2	1.0
7	A52209	Engineering Chemistry Lab	0	0	3	1.5
8	A52210	Programming for Problem Solving-II Lab	0	0	3	1.5
	TOTAL				11	18.5



Item 9:

Approval to reorganise the syllabus for the 3rd Year B.Tech course titled Essentials of Machine Learning



ESSENTIALS OF MACHINE LEARNING (Old)

BTech (/	neste	er	De	ept. of Artifi	cial Intellig	gence		
Code	Category	Ηοι	ırs / ˈ	Week	Credits	Marks		
	PCC	L	Т	Р	С	CIE	SEE	Total
		3	1	0	4	40 60 100		

Course Objectives

- 1. Understand the basic concepts of feature engineering and machine learning systems
- 2. Apply and evaluate supervised machine learning algorithms for classification and regression tasks
- 3. Apply and evaluate unsupervised learning algorithms for clustering tasks.
- 4. Understand the Bayesian and Ensemble learning, apply and evaluate different types of these algorithms for better prediction.
- 5. Understand and Design Artificial Neural Networks computational model

Course Outcomes

At the end of this course, students will be able to:

- Understand the essentials of feature engineering, state-of-art tools and concepts of machine learning
- 2. Design and evaluate different types of supervised learning algorithms for classification and regression tasks
- 3. Design and evaluate different types of unsupervised learning algorithms for clustering tasks
- 4. Design and evaluate strong learners for better real time prediction such as Bayesian and ensemble learning algorithms
- 5. Design Artificial neural networks computational model

UNIT-I

Machine Learning: Definition and Applications, Types of Machine Learning Models - Supervised, Unsupervised, Reinforcement learning, Challenges of Machine Learning, State-of-art Languages and Tools in Machine Learning, Preparing to Model - Model Representation - Overfitting and Underfitting, Bias—variance trade-off

Feature Engineering: Feature Transformation, Feature Extraction and Feature Selection Process



UNIT-II

Supervised Learning: Applications - Regression and Classification Tasks, Evaluating performance of regression and classification models, Regression Algorithms - Simple Linear Regression and Multiple Linear Regression, Classification Algorithms - Logistic Regression, k-Nearest Neighbor, Decision Tree

UNIT-III

Unsupervised Learning: Applications of Unsupervised Learning, Different types of Clustering techniques, K-Means Clustering, K-medoids, Agglomerative Hierarchical Clustering, Evaluating performance of clustering models.

UNIT-IV

Bayesian Learning: Bayesian Belief Networks, MAP hypothesis, Bayes Optimal Classifier, Gibbs Classifier, Naïve Bayes Classifier

Ensemble Learning: Bootstrap Aggregation (Bagging) - Random Forest, Boosting - AdaBoost and Gradient Boost.

UNIT-V

Artificial Neural Networks: Understanding the Biological Neuron, Exploring the Artificial Neuron, Types of Activation Functions, Early Implementations of ANN, and Architectures of Neural Network- Feed forward network and Recurrent network, Back propagation algorithm

Text Books

- 1. Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das, *Machine Learning*, 2019, Pearson
- 2. Tom M. Mitchell, —*Machine Learning*, McGraw-Hill Education (India) Private Limited, 2013

References

- 1 Andreas C. Müller, Sarah Guido, *Introduction to Machine Learning with Python*, O'Reilly Media, Inc, October 2016
- 2 Ethem Alpaydin Introduction to Machine Learning (Adaptive Computation and Machine Learning), The MIT Press 2004
- 3 Aurélien Géron, Hands on Machine Learning with Scikit-Learn, Keras, and TensorFlow Concepts, Tools, and Techniques to Build Intelligent Systems, O'Reilly Media, Inc 2019



ESSENTIALS OF MACHINE LEARNING (Revised)

BTech (A	(AI) III Year I Semester Dept. of Artificial Intelligence							
Code	Category	Hours / Week		Credits	Marks			
	PCC	L	Т	Р	С	CIE	SEE	Total
		3	1	0	4	40	60	100

Course Objectives

- 1. Understand the basic concepts of feature engineering and machine learning systems
- 2. Apply and evaluate supervised machine learning algorithms for classification and regression tasks
- 3. Apply and evaluate unsupervised learning algorithms for clustering tasks.
- 4. Understand Bayesian and Ensemble learning, apply and evaluate different types of these algorithms for better prediction.
- 5. Understand and Design Artificial Neural Networks computational model

Course Outcomes

At the end of this course, students will be able to:

- Understand the essentials of feature engineering, state-of-art tools and concepts of machine learning
- 2. Design and evaluate different types of supervised learning algorithms for classification and regression tasks
- 3. Design and evaluate different types of unsupervised learning algorithms for clustering tasks
- 4. Design and evaluate strong learners for better real time prediction such as Bayesian and ensemble learning algorithms
- 5. Design Artificial Neural Networks computational model

UNIT-I

Machine Learning: Introduction, Definition and Applications, Types of Machine Learning Models - Supervised, Unsupervised, Reinforcement learning, Applications, State-of-theart Languages and Tools, Preparing to Model: Basic Types of Data, Exploring Structure, Data Quality and Remediation. Model Representation: Overfitting and Underfitting, Biasvariance trade-off

Feature Engineering: Feature Transformation, Feature Extraction and Feature Selection Process



UNIT-II

Supervised Learning: Applications. Classification and Regression Tasks, Evaluating performance of classification and regression models, Classification Algorithms: k-Nearest Neighbor, Decision Tree. Regression Algorithms: Simple Linear Regression, Multiple Linear Regression, Logistic Regression

UNIT-III

Unsupervised Learning: Applications, Clustering task, Different types of Clustering techniques: K-Means Clustering, K-medoids, Agglomerative Hierarchical Clustering, Evaluating performance of clustering models.

UNIT-IV

Bayesian Learning: Bayes' Theorem and Concept Learning: Brute-force algorithm, Consistent Learners, Bayes Optimal Classifier, Naïve Bayes Classifier, Bayesian Belief Networks

Ensemble Learning: Bootstrap Aggregation (Bagging) - Random Forest, Boosting - AdaBoost and Gradient Boost.

UNIT-V

Artificial Neural Networks: Understanding the Biological Neuron, Exploring the Artificial Neuron, Types of Activation Functions, Early Implementations of ANN. Architectures of Neural Network: Single-layer feed forward network, Multi-layer feed forward network, Competitive network, Recurrent Network. Learning Process in ANN. Back propagation algorithm

Text Books

- 1. Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das, *Machine Learning*, 2019, Pearson
- 2. Tom M. Mitchell, *Machine Learning*, McGraw-Hill Education (India) Private Limited, 2013

References

- 1 Andreas C. Müller, Sarah Guido, Introduction to Machine Learning with Python, O'Reilly Media, Inc, October 2016
- 2 Ethem Alpaydin. *Introduction to Machine Learning (Adaptive Computation and Machine Learning)*, The MIT Press 2004
- 3 Aurélien Géron, Hands on Machine Learning with Scikit-Learn, Keras, and TensorFlow Concepts, Tools, and Techniques to Build Intelligent Systems, O'Reilly Media, Inc 2019



Item 10:

Approval of the syllabus of Research Paper Writing and Publication Ethics (RPW&PE) course of Pre-Ph.D.



Course contents of Research Publication Ethics (part of RPW&PE-Course)

In the 4th Academic council meeting it is resolved to rename the existing compulsory preregistration RPWP course into the "Research Paper Writing and Publication Ethics (RPW&PE)" course with four credits and 100 marks. (As per UGC Guidelines). Further it is also resolved to evaluate RPW&PE for 100 marks with 30 marks for technical writing of the RPWP-seminar content and 40 marks for technical presentation, and 30 marks for Research Publication Ethics.

Couse Objectives

- 1. To define the basic terminology of philosophy and ethics of publications.
- 2. To know about the respect to science and research.
- 3. To understand about the publication ethics.
- 4. To find the right journal to publish the research.
- 5. To know the ethical issues of authorship, conflict of interest and plagiarism
- 6. To understand the indexing, citation of the database and impact factor.

Course Outcomes

At the end of course, the students will be able to,

- CO 1: Understand the moral philosophy and ethics of publication
- CO 2: Identify the ethics with respect to the science, research and reporting data
- CO 3: Able to implement publication ethics.
- CO 4: Distinguish different journals to identify right one.
- CO 5: Judge the ethical issues of authorship, conflict of interest and plagiarism
- Co 6: Write the research article by following the ethics in high impact factor journal.

UNIT I

Philosophy and Ethics & Scientific Conduct

- 1. Introduction to philosophy: definition, nature and scope, concept, branches
- 2. Ethics: definition, moral philosophy, nature of moral judgments and reactions

Scientific Conduct

- 1. Ethics with respect to science and research
- 2. Intellectual honesty and research integrity
- 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
- 4. Redundant publications: duplicate and overlapping publications, salami slicing
- 5. Selective reporting and misrepresentation of data



UNIT II

Publication Ethics & Misconduct and Software Tools

- 1. Publication ethics: definition, introduction and importance
- 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
- 3. Conflicts of interest
- 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types
- 5. Violation of publication ethics, authorship and contributor ship
- 6. Identification of publication misconduct, complaints and appeals
- 7. Predatory publishers and journals
- 8. Use of plagiarism software like Turnitin, Urkund and other open-source software tools

UNIT III

Open Access Publishing

- 1. Open access publications and initiatives
- SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies
- 3. Software tool to identify predatory publications developed by SPPU
- 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.

UNIT IV

A. Databases

- Indexing databases
- 2. Citation databases: Web of Science, Scopus, etc.

B. Research Metrics

- Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
- 2. Metrics: h-index, g index, i10 index, altimetric
- 3. Patent application, registration, Ethics in filing patents; various agencies

UNIT V

LaTeX – A document preparation system



Introduction to LaTeX; what LaTeX is, the features of LaTeX and how it works. Advantages of LaTeX; Learn how and where to get LaTeX for Linux, Mac OS X, Windows and Online; General documentation: hook management, page mark management, typesetting mathematics, summary of changes by release, source code documentation; Document / Research paper/ Thesis/ seminar reports writing practices using LaTeX.

Process of Evaluation: The scholars should present two seminars before internal DRC. Each seminar is evaluated for 30 marks and average of the two seminars will be considered for final award of marks.

References

- 1. Bird, A., (2006), Philosophy of Science, Routledge.
- 2. Alasdair MacIntyre, (2002), 'A Short History of Ethics', University of Notre Dame Press.
- 3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
- 4. Indian National Science Academy (INSA), Ethics in Science Education, Research and Governance (2019), ISBN:978-81-939482-1-7. http://www.insaindia.res.in/pdf/Ethics Book.pdf.
- 5. Alavudeen, A., Kali rahman, R., Jayakumaran, M., (2015), 'Prfessional Ethics and Human Values', University Science Press.
- 6. Eun Seong Hwang, Eun Hee Cho, Young-Mog Kim, Kibeom Park, Wha-Chul Son,
- 7. Tae-Woong Yoon, Jeong Mook Lim, (2016), Manual for Research and Publication Ethics in Science and Engineering, Korean Federation of Science and Technology Societies, Seoul, Korea
- 8. Wakil kumar Yadav, Jitendranath Gorai, Ms Seema Shukla, Yogendra Kumar, Dr Dinesh Sriwash, Dr Dev Brat Mishra Dev, Kamlesh Paswan, 'Research and Publication Ethics', Notion Press.

The following committee is constituted to frame the syllabus of "Research Publication" Ethics", of "Research Paper Writing and Publication Ethics (RPW&PE)" course. The above syllabus was framed by the committee.

1.	Dr. KRC Reddy Professor of Civil Engineering	Chairperson
2.	Dr. M.Sridevi, Associate Professor Department of CSE	Member
3.	Dr. Ch. Hemanth, Assistant Professor, Civil engineering	Member
4.	Dr. Ashish Singh, Assistant Professor	Member
5.	Dr. G. Kiran, Professor , School of Pharmacy	Convener



Item 11:

Amendment of the Ph. D. Regulations (section 5.1) with reference to the eligibility criteria for admission into the Ph. D. program for MCA & M. Sc. (Computer Science) graduates



Introduction of a new Ph. D. Program in Computer Science Application for MCA. or M.Sc. Computer Science/ Information Technology/ Data science Degree holders.

Eligibility Criteria: Ph.D. in Computer science Application: MCA or M.Sc. Computer Science/ Information Technology/ Data science or its equivalent degree holders with a minimum of 55% marks from a university / institution recognized by Anurag University. A 5% relaxation in minimum marks will be applicable for SC/ST/OBC (non- creamy layer)/differently-abled candidates as per the UGC norms. The other rules will be applicable as per the current AU Ph.D. rules and regulations.

It is approved in the 5th BoS meeting of CSE department held on 25-07-2022.



Item 12: Approval of the amendments of MBA Regulations (R22)



Based on the recommendations of the Chancellor and committee in 4th Academic Council, the following modifications are suggested in the Academic regulations of R22 regulations of MBA including ICET and MBA Business Analytics Programme.

- 1. 2 The MBA program duration shall be two academic years divided into Six Trimesters/Terms and each Term having around 12-14 weeks including examinations
- For theory courses the distribution shall be 60 marks for Continuous Internal Evaluation (CIE) and 40 marks for the Term End Examination (TEE).

Components	Maximum Marks
Internal Examination Assessment	
Continuous Internal Assessment	20
Mid Term Examination	25
Class participation	15
Term End Examinations	40
Total Marks	100

4.3 The distribution of marks for Continuous Internal Evaluation (CIE) and the Term End Examination (TEE) along with the minimum pass percentage shall be as follows:

	Continuous Internal	End Term Examination	Minimum Academic Requirement to Pass a course			
Course	Evaluation (CIE)	(TEE)	*Minimum Pass Percentage (TEE)	*Minimum Pass Percentage (CIE+TEE)		
Theory	60	40	50	50		
Laboratory	60	40	50	50		
Company Analysis Report	100	0	-	50		
Social Immersion Project	100	0	-	50		
Internship / Project	60	40	50	50		
Specialization Project	100	-	-	50		

^{*} A relaxation of 10% of maximum marks shall be given to physically challenged students.



4.3.1 Continuous Internal Evaluation (CIE)

The CIE for Theory Courses has the following two components of Assignments, Mid Term examination comprising of 60marks:

a) Mid-term examination:

For theory subjects, there shall be one midterm examinations in each term for 25 marks as a part of continuous evaluation. Each midterm examination shall be conducted for the duration of 90 minutes and the question paper consists of Part-A shall contain 5 questions, each carrying 2 marks (Short Answers) for 10 marks and Part-B (Long Answers) for 15 marks. Part-B shall contain 5 questions of which student have to answer 3 questions; each question carries 5 marks.

Midterm examination shall be conducted for 2.5 units of syllabus at the end of 6-7 weeks of instruction.

There shall be an optional second midterm examination during the preparation cum external practical examinations period or during external examination subject to the following conditions:

- Interested students have to register for the Second mid examination by paying the prescribed registration fee.
- Second midterm examination covers entire Term syllabus carrying 25 marks and best of two mid examinations shall be taken as final mid marks secured by each candidate.

b) Assignments/ Case Analysis /Quizzes:

The faculty teaching the course defines the scheme of distribution of assignments etc., in consultation with respective Area Chairs and Head of the department and evaluates the students for 20 marks by conducting a minimum of two evaluation components of the following - Case studies / Assignments / Seminars / quizzes / Group Activities / periodical tests or any other as relevant. At least one group activity should be a part of the assignment and a minimum of 2 activities should be conducted during the term per course.



c) Class Participation: 15 marks for class participation is considered to be a part of internal evaluation. Class participation is assessed based on the parameters of initiative of the student, application/preparation and contribution/creativity of the student in the class. The metrics for class participation will be distributed as around 30%-40% for each parameter and will be defined at the commencement of term by faculty in coordination with Area Chairs and Head of the department.

4.4 Term End Examinations (TEE):

- 4.4.1 The Term End examination will be conducted for 40 marks which consist of two parts viz., i). Part - A for 10 marks, ii). Part - B for 30 marks.
- 4.4.2 Part-A is compulsory, which consists of five (numbered from 1 to 5) with two questions from each unit carrying 2 marks each.
- 4.4.3 Part-B consists of five questions (numbered from 6 to 10) shall be set by covering one question (may contain sub-questions) from each unit of the syllabus carrying 6 marks each. For each question there will be an "either" "or" choice (that means there will be two questions from each unit and the student should have to answer any one of them).
- 4.4.4 For all laboratory courses, there shall be CIE during a Term for 60 marks and TEE for 40 marks. Out of the 60 marks for CIE, the breakup shall be as follows:

i. Lab participation and record maintenance: 10 Marks ii. Completion of Experiment: 10 Marks iii. Skill Test: 20 Marks Project / Assignment: 20 Marks iv.

4.4.5 Managerial Competency courses are introduced to develop the managerial competencies of the students and to develop a better industry perspective. These courses shall be evaluated internally through presentation and seminars by students. 1 credit courses of Company Analysis report, Aesthetics, Approaches to Thinking and Design Thinking shall be evaluated for 100 marks internally. There shall be no



external evaluation for these courses.

4.4.6. There shall be a social immersion project where they can study a social issue / participate in institution enterprise, to be taken up during the 3rd term. Social Immersion / Institution enterprise observations shall be submitted in report form and should be presented before an internal committee, which shall be evaluated for 100 marks.

4.4.7. A summer internship / Project is an important step in process of providing opportunity for industry exposure and work closely with professionals. There shall be an Internship / Project, to be taken up after completion of third trimester and carried out for 6 to 8 weeks duration. The student must identify real time managerial issues of chosen organization. The internship / Project report work shall be submitted in report form and seminars presented before the Project review committees. The report submission should be completed by the end of 4th term. The report shall be evaluated for 60 marks by an internal panel and 40 marks by external of evaluators and obtaining 50% marks for the report is mandatory for the award of the degree.

Two courses from Term II are moved to Term III to balance the workload among the terms.

Course	Credit
Cost Analysis for decision making	2
Data Visualization with Tableau	1



Item 13:

Any other item with the permission of the chair



Addendum - Tabled Agenda

Item 13: Any other item with the permission of the chair

a) Ratification of constitution of Departmental Research Committees (DRCs) for all the departments;

Department of Artificial Intelligence

S. No	Name of the Faculty	Designation	DRC
1	Prof S Sameen Fatima	Professor, Head, Chairperson - BoS	Chairperson
			& Convener
2	Dr. Tilottama Goswami	Professor	Internal Member
3	Dr .S. Krishna Anand	Professor	Internal Member
4	Dr. Abdul Ahad	Associate Professor	Internal Member
5	Dr Pardeep Kumar	Assistant Professor	Internal Member
6	Dr. Manoranjan Dash	Assistant Professor	Internal Member
7	Prof. Salman Abdul Moiz		External Member
		School of Computer and Information	
		Sciences, University of Hyderabad.	
		Mail Id:- salman@uohyd.ac.in	
		<u>Tel:-</u> 9885049992	

Department of Chemical Engineering

S.No	Name of the Faculty	Designation	DRC
1	Prof. M. Mukunda	Professor & HoD, Chairperson BoS	Chairperson
	Vani		& Convenor
2	Dr. N. Anil	Associate Professor	Internal
	DI. N. AIIII		Member
3	Dr. M. B. Venkata	Assistant Professor	Internal
	Ramana Reddy	Assistant Froiessor	Member
4	Dr. T. Vijaya Kumar	Assistant Professor	Internal
	Di. 1. Vijaya Kumai	Assistant Floressor	Member
5	Prof V.V Basava	Head, Department of Chemical Engineering,	
	Rao	College of Technology, Osmania	External
		University, Hyderabad,	Member
		Mail id: profbasavarao 1964@yahoo.com,	Wieinber
		Tel:-9989156705.	



Department of Civil Engineering

S. No	Name of the Faculty	Designation	DRC
1	Dr. K. Ramachandra Reddy	Professor and Chairperson BoS	Chairperson
2	Dr. B. Narender	Associate Professor and HoD	Convenor
3	Dr. P. Pradeep Kumar	Associate Professor	Internal Member
4	Dr. K. Madhusudan Reddy	Associate Professor	Internal Member
5	Dr K J N Sai Nitesh	Assistant Professor	Internal Member
6	Prof.K L Radhika	Professor, Department of Civil	External
		Engineering, College of Engineering,	Member
		Osmania University, Hyderabad,	

Department of Computer Science and Engineering

S. No	Name of the Faculty	Designation	DRC
1	Dr. V Vijaya Kumar	Professor & Chairperson BoS	Chairperson
2	Dr. G Vishnu Murthy	Professor & HoD	Convenor
3	Dr. Sandeep Singh Rawat	Professor - CSE	Internal Member
4	Dr. M Sridevi	Associate Professor - CSE	Internal Member
5	Dr. A Mallikarjuna Reddy	Associate Professor - CSE	Internal Member
6	Dr. K. Shyamala	Professor Department of Computer Science and Engineering, Osmania University, Hyderabad, Mail id:- prkshyamala@gmail.com, Tel:-9490219882	External Member

Department of Electronics and Communication Engineering

S.No	Name of the Faculty	Designation	DRC
1	Dr. K.S. Rao	Professor, Director & Chairperson BoS	Chairperson
2	Dr. S. Sathees Kumaran	Professor & HoD	Convenor
3	Dr. M.Santhosh	Associate Professor	Internal Member
4	Dr. T. Rajesh	Associate Professor	Internal Member
5	Dr. K. Hari Priya	Associate Professor	Internal Member
6	Dr. P. Chandra Sekhar	Professor, Department of Electronics and Communication Engineering, Osmania University, Hyderabad,	External Member



Mail id:	
sekharpaidimarry@gmail.com,	
Tel:- No: 9866695963	

Department of Electrical and Electronics Engineering

S.No	Name of the Faculty	Designation	DRC
1	Dr. PVN Prasad	Professor, Chairperson BoS	Chairperson
2	Dr. T. Anil Kumar	HoD, Associate Professor	Convener
3	Dr. D. Mohan Reddy	Professor	Internal
			Member
4	Dr. G. Venu Madhav	Associate Professor	Internal
			Member
5	Dr. C. Nagamani	Assistant Professor	Internal
			Member
6	Dr. E.Vidya Sagar	Associate Professor, Dept. of Electrical	External
		Engg., Osmania University, Hyderabad,	Member
		Mail id:evsueou@gmail.com	
		Tel:-9985256268	

Department of Information Technology

S. No	Name of the Faculty	Designation	DRC
1	Dr. Sudheer Reddy K.	Professor, Head, Chairperson - BoS	Chairperson
			& Convener
2	Prof. P.V.Kumar	Professor	Internal
			Member
3	Dr. A. Prasanth Rao	Professor	Internal
			Member
4	Dr. D. Lakshmi	Associate Professor	Internal
	Padmaja		Member
5	Dr. PV Sudha	Professor, Dept. of CSE, Osmania	External
		University, Hyderabad, Mail id:-	Member
		sudha392623@yahoo.com, Tel:-942754480	



Department of Mechanical Engineering

S.No.	Name of the Faculty	Designation	DRC
1	Dr.S. Madhu	Professor & Head	Chairperson
2	Dr.T Krishnaiah	Associate Professor & Chairman, BoS	Convenor
3	Dr. P Ravikanth Raju	Associate Professor	Internal Member
4	Dr. Md. Sikindar Baba	Associate Professor	Internal Member
5	Dr Jibitesh Kumar		Internal Member
	Panda	Assistant Professor	
6	Dr. L Siva Rama Krishna	Professor, Department of Mechanical Engineering, Osmania University,	External Member
	Kilsilia	Hyderabad, Mail id: srkmed2014@gmail.com,	
		Tel:- 9849867046	

School of Pharmacy

S. No	Name of the Faculty	Designation	DRC
1	Dr. Vasudha Bakshi	Professor, HoD& Dean,	Chairperson &
		Chairperson BoS	Convenor
2	Dr. G. Kiran	Professor	Internal Member
3	Dr. A. Padmanabha Rao	Associate Professor	Internal Member
4	Dr. A. Madhubabu	Associate Professor	Internal Member
5	Dr Chandaiah Godugu	Associate Professor, NIPER,	External Member
		mailid: chandra.niperhyd@gov.in,	
		Tel:- 9553331860	

School of Management

S.No	Name of the faculty	Designation	DRC
1	Dr. G.Sabitha	Associate Professor, Chairman -BoS,	Chairperson
		Convener - Career Guidance Cell	
2	Dr.V.Vishnu Vandana	Asso. Professor & HoD; Coordinator -	Convenor
		Entrepreneurship Development Cell	
3	Dr. K. Mamatha	Professor, TPO	Internal Member
4	Dr.Syed Mansoor Pasha	Assistant Professor	Internal Member
5	Dr.C. Mallesha	Assistant Professor	Internal Member
6	DrK.G. Chandrika	Professor, Dept. of Business	External Member
		Management, Osmania University,	
		Hyderabad, Mail id:	



	kgchandrika@rediffmail.com,	
	Tel:- 9391068691	

Department of Mathematics

S.No	Name of the Faculty	Designation	DRC
1	Dr.V.Srinivasa Rao	Professor, Chairperson BoS	Chairperson
2	Dr.K.Shiva Reddy	Professor, HoD	Convenor
3	Dr.Y.Dharmendar Reddy	Associate Professor	Internal Member
4	Dr.G.Ranjith Kumar	Associate Professor	Internal Member
5	Dr.P.Mangathai	Associate Professor	Internal Member
6	Dr.B.Surender Reddy	Professor, Dept. of Mathematics, Osmania University, Hyderabad, Mail id: bsrmathou@osmania.ac.in Tel:- 9000070756	External Member

Department of Physics

S.No	Name of the Faculty	Designation	DRC	
1	Dr. M.Srinivasa Reddy	Professor, HoD & chairman BoS	Chairperson & Convenor	
2	Prof. M.Mutha Reddy	Professor, Dean Exams	Internal Member	
3	Dr. R.V. Sudheer Kumar	Associate Professor	Internal Member	
4	Dr.Y.Vijay Kumar (Expected To Join By 20.01.2021)	Assistant Professor	Internal Member	
5	Prof. Maqbool Ahmed	Professor Department of Physics, Hyderabad Central University, Hyderabad, Mail id:- smahmedhyd@gmail.com Tel:-9492042609	External Member	



Department of Chemistry

S. No	Name of the Faculty Designation		DRC	
1	Dr. Savita Belwal	Professor & HoD	Chairperson & Convenor	
2	Dr. Tejaswi Jella	Assistant Professor	Internal Member	
3	Dr. A. Ravi	Assistant Professor	Internal Member	
4	Dr. M. Vijjulatha	Professor, Department of Chemistry, Osmania University, Hyderabad, Mail id:- vijjulathamanga@gmail.com Tel:-9866845408	External Member	

Department of English

S.No	Name of the Faculty	Designation	DRC	
1	Dr G V S Ananta Lakshmi	Professor & HoD, Chairperson	Chairperson &	
		BoS	Convenor	
2	Dr V S V Laxmi Ramana	Professor	Internal Member	
3	Dr M Srinivas Rao	Associate Professor	Internal Member	
4	Dr V Padma	Associate Professor	Internal Member	
5	Dr C.Muralikrishna	Professor, Department of English, Osmania University, Hyderabad, Mail id:- cmkrishn17@yahoo.co.in Tel:-9848249285	External Member	



b) Ratification of the appointment of Research Supervisors;

Department of Artificial Intelligence

- 1. Dr Tilottama Goswami, Professor
- 2. Dr Pardeep Kumar, Assistant Professor

Department of Computer Science and Engineering

- 1. Dr V Vijaya Kumar, Professor
- 2. Dr Vishnu Murthy, Professor
- 3. Dr Sandeep Singh Rawat, Professor
- 4. Dr A Mallikarjuna Reddy, Assistant Professor
- 5. Dr Dasika Sree Rama Chandra Murthy, Professor
- 6. Dr M Sridevi, Associate Professor
- 7. Dr Pulipati Srilatha, Assistant Professor
- 8. Dr V Padmavathi, Associate Professor
- 9. Dr G Bindu Madhavi, Assistant Professor
- 10. Dr G Bala Krishna, Assistant Professor

Department of Electrical and Electronics Engineering

- 1. Dr P V N Prasad, Professor
- 2. Dr T Anil Kumar, Associate Professor
- 3. Dr R Somanathan, Professor
- 4. Dr G Venu Madhav, Associate Professor



- 5. Dr C Nagamani, Associate Professor
- 6. Dr D Mohan Reddy, Professor
- 7. Dr P Nagaraju Mandadi, Associate Professor
- 8. Dr Harish Pulluri
- 9. Dr Srikanth Goud B Assistant Professor

Department of Electronics and Communication Engineering:-

- 1. Dr K Srinivasa Rao, Professor
- 2. Dr S Satheeskumaran, Professor
- 3. Dr M Chandrashekar, Professor
- 3. Dr M Santosh, Assistant Professor
- 4. Dr Rajesh Thumma, Assistant Professor
- 5. Dr D Haripriya, Assistant Professor
- 6. Dr D Narendar Singh, Assistant Professor
- 7. Dr Ashish Singh, Assistant Professor
- 8. Dr M Narayana, Professor
- 9. Dr E Srinivas

Department of Information Technology

- 1. Dr K Sudheer Reddy, Professor
- 2. Dr A Prasantha Rao, Professor
- 3. Dr Y Venkata Ramana Reddy, Associate Professor



- 4. Dr Kachapuram Basava Raju, Associate Professor
- 5. Dr Ms. Hema, Associate Professor

Department of Mechanical Engineering

- 1. Dr A V Sita Rama Raju, Professor
- 2. Dr S Madhu, Professor
- 3. Dr R Venkat Reddy, Professor
- 4. Dr Md Sikindar Baba, Associate Professor
- 5. Dr Shaik Shafee, Professor
- 6. Dr P Ravikanth Raju, Associate Professor
- 7. Dr T Krishnaiah, Associate Professor
- 8. Dr L Venugopal, Associate Professor
- 9. Dr N Maddan Mohan Reddy, Assistant Professor
- 10. Dr Baramavatu Praveen, Assistant Professor
- 11. Dr G Parthasarathi, Associate Professor
- 12. Dr Jibitesh Kumar, Assistant Professor

Department of Civil Engineering:-

- 1. Dr KRC Reddy, Professor
- 2. Dr Gummadi Venkata Rao
- 3. Dr B Narender, Associate Professor
- 4. Dr Syed Omar Ballari, Associate Professor



- 5. Dr P Pradeep Kumar, Associate Professor
- 6. Dr K J N Sai Nitesh, Assistant Professor
- 7. Dr Sambit Kumar Beura, Assistant Professor

Department of Chemical Engineering:-

- 1. Dr M Mukunda Vani, Professor
- 2. Dr M Venkata Ramana Reddy, Assistant Professor

School of Pharmacy:-

- 1. Dr Bakshi Vasudha, Professor
- 2. Dr Gangarapu Kiran, Professor
- 3. Dr Madhu Babu, Associate Professor
- 4. Dr Ram Mohan Manda, Associate Professor
- 5. Dr Baba Shankar Rao Garige Associate Professor
- 6. Dr Dibyalochan Mohanty, Associate Professor
- 7. Dr M Akiful Haque, Associate Professor
- 8. Dr Ananda Kumar Chettupalli, Associate Professor
- 9. Dr D Krishna Prasad, Associate Professor
- 10. Dr B Hemanth Kumar, Associate Professor
- 11. Dr D Sireesha, Assistant Professor
- 12. Dr Jainendra Kumar B, Assistant Professor
- 13. Dr A Padmanabha Rao, Assistant Professor



School of Management:-

- 1. Dr Balaji Utla, Professor and Dean
- 2. Dr PSS Murthy, Professor
- 3. Dr G Sabitha, Associate Professor
- 4. Dr V Vishnu Vandana, Associate Professor
- 5. Dr K Mamatha, Associate Professor
- 6. Dr Syeed Mansoor Pasha, Assistant Professor
- 7. Dr C Mallesha, Assistant Professor
- 8. Dr Seema Nazneen, Assistant Professor
- 9. Dr G Mahender, Assistant Professor

Department of English

- 1. Dr G V S Ananta Lakshmi, Professor
- 2. Dr V S V Laxmi Ramana, Professor
- 3. Dr Pradeep Kumar, Assistant Professor
- 4. Dr Badi Duli, Assistant Professor
- 5. Dr M Sridhar, Assistant Professor

Department of Mathematics

- 1. Dr V Srinivasa Rao, Professor
- 2. Dr K Shiva Reddy, Professor
- 3. Dr Y Dharmendar Reddy, Associate Professor
- 4. Dr M Anil Kumar, Assistant Professor
- 5. Dr P Magathai, Assistant Professor
- 6. Dr K Ramesh, Associate Professor
- 7. Dr D Manohar, Assistant Professor
- 8. Dr G Ranjith Kumar, Associate Professor

Department of Physics:-



- 1. Dr M Srinivas Reddy, Professor
- 2. Dr.R.V. Sudheer Kumar, Associate Professor
- 3. Dr Vijaya Kumar Y Assistant Professor
- 4. Dr M Venkata Ramana



Department of Chemistry:-

- 1. Dr Savita Belwal, Professor
- 2. Dr Ravi Arukula, Assistant Professor
- 3. Dr Kanchanapally Ravindra Chary
- 4. Dr Godumala Mallesham, Assistant Professor
- 5. Dr Balakonda Reddy Sana, Assistant Professor
- 6. Dr Marri Pradeep Kumar, Assistant Professor

c) Approval to authorize the Vice-Chancellor to constitute / reconstitute Departmental **Research Committees (DRCs)**

To expedite the matters, we seek the approval from the Academic Council to authorize the Vice-Chancellor to constitute or reconstitute the DRC's.



d) A Report on Evaluation System and Reforms

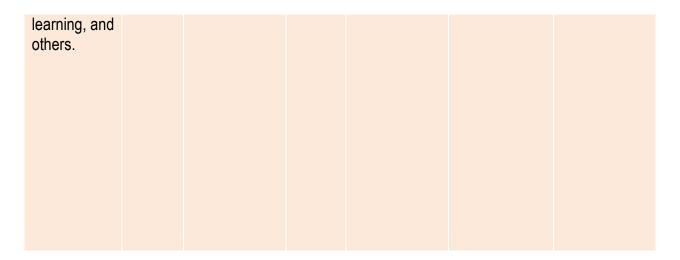
Recommendations on the Evaluation System

1. Proposed Continuous Internal Evaluation (CIE) framework

- The proportion of CIE to SEE is 40:60, which is moderate now and need to focus on the standardization and stabilization of various evaluation components. Appropriate types of evaluation components for CIE have to be developed to suit the requirements of each course.
- The committee has recommended the following evaluation components along with their weightages:

Element	Duration (in minutes)		Max. Marks		No. of occurrences	
	Existi	Recommend	Existi	Recommend	Existing	Recommend
	ng	ed	ng	ed		ed
Midterm Examinatio n	90	60	20	20	3	2
Evaluation component s: Assignment / Presentation / Unit Tests / Quiz / participatory learning / project- based	-	-	20	20	2 - Assignments, 5 - Quizzes	Record of minimum 2 evaluations from the Evaluation components





• It is recommended to scrap the 3rd midterm examination. However, a makeup test may be conducted by an instructor if it is deemed appropriate.

2. Declaration of Results

The committee has recommended that, the results are to be declared within 15-20 days from the date of the last examination. There shall be a timeline (to be prepared in-line with the Academic Calendar) in which the notification date, start date of the examination, end date of the examination and tentative date of announcement of results are to be included. This practice would certainly help the progress of students and enhance the reputation of the University.

The committee has also recommended to practice on-screen evaluation system to have quick processing of results.

3. On Demand Supplementary Examinations

If a student secures F grade in any of the courses of a semester, an instant supplementary Semester End Examination (only for Semester End Examination) will be conducted within two weeks of the declaration of the results.

It is strongly recommended to step towards the on-demand examinations facility.



Mega Examinations on Demand is yet another practice through which students can register and appear all backlog courses after announcement of the results of the 8th semester.

Keeping in view of the larger interest of students the committee recommended to practice Mega Examinations on Demand at Anurag University.

4. Transparency in Semester End Examinations

In order to maintain transparency in evaluation process, several Universities in India and abroad are following the practice of displaying or showing the answer books to the students. Further, several assessment and accreditation bodies are insisting upon the transparency of the evaluation process.

Therefore, the committee has unanimously recommended showing the digitized answer booklets of the Semester End Examination to the students on payment of the prescribed fee.

5. Question Bank

Question bank is the most effective way to integrate teaching and evaluation.

The committee has suggested creating a question bank in which questions are tagged with the Bloom's Taxonomy level and complexity levels (i.e., simple, medium, complex) which may be useful for paper setting.

6. Use of Technological Interventions

It is recommended to upgrade the existing digital infrastructure with a new ERP system that should assist the people and processes. This would empower the University to have all single bits and pieces of information stored in the ERP system.



7. Flexible Curriculum

The committee has suggested adopting the Flexible Curriculum. It is advised to formulate a committee to device the modalities and action plan to implement the same.

8. NEP-2020

It is advised to form a committee to discuss, deliberate, device modalities and prepare an action plan to implement the NEP-2020 on the points listed below.

- Academic Bank of Credits (https://www.abc.gov.in/)
- Accessibility and Verifiability of Degrees
- Multiple entry and exit points

9. Members of the Committee

Dr. P. Narayana Reddy, Dean, School of Agriculture	Chairperso n
Mrs. M. Mangala Gouri, Associate Professor, Dept. of ECE	Member
Dr. K. Sudheer Reddy, Dean, Academic and Planning	Member
Dr. G. Vishnu Murthy, Dean, School of Engineering	Member
Dr. Padmanabha Rao, Associate Professor, School of	Member
Pharmacy	
Dr. Sikindar Baba, Controller of Examinations	Convener