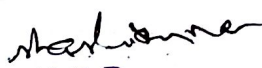


SUSTAINABLE AGRICULTURE AND FOOD SECURITY (OEC-I)			
Course Code	21AG653	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	(3:0:0:0)	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Course Objectives: <ul style="list-style-type: none"> To study the importance of sustainable agriculture for the growing population, various resources required and their sustainability Importance of science, food security and ecological balance 			
Teaching-Learning Process (General Instructions) These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes. <ol style="list-style-type: none"> Adopt different types of teaching methods to develop the outcomes through PowerPoint presentations and Video demonstrations or Simulations. Chalk and Talk method for Problem Solving. Arrange visits to show the live working models other than laboratory topics. Adopt collaborative (Group Learning) Learning in the class. Adopt Problem Based Learning (PBL), which fosters students Analytical skills and develops thinking skills such as evaluating, generalizing, and analyzing information. Conduct Laboratory Demonstrations and Practical Experiments to enhance experiential skills. 			
Module-1			
LAND RESOURCE AND ITS SUSTAINABILITY: Land Resources of India, Population and land, Land utilization, Net Area Sown, changes in cropping pattern, land degradation.			
Teaching-Learning Process	<ol style="list-style-type: none"> PowerPoint Presentation Chalk and Talk are used for Problem Solving (In-general) Video demonstration or Simulations Laboratory Demonstrations and Practical Experiments 		

Module-2	
WATER RESOURCE AND ITS SUSTAINABILITY : Rainfall forecasting - Adequacy of Rainfall for crop growth - Rainfall, Drought and production instability - Irrigation potential - Available, created and utilized - River basins; Watersheds and Utilizable surface water - Utilizable water in future (Ground water & Surface water)	
Teaching-Learning Process	<ol style="list-style-type: none"> 1. PowerPoint Presentation 2. Chalk and Talk are used for Problem Solving (In-general) 3. Video demonstration or Simulations 4. Laboratory Demonstrations and Practical Experiments
Module-3	
SUSTAINABLE AGRICULTURE & ORGANIC FARMING: Agro-ecosystems - Impact of climate change on Agriculture, Effect on crop yield, effect on Soil fertility - Food grain production at State Level - Indicators of Sustainable food availability - Indicators of food production sustenance - Natural farming principles - Sustainability in rainfed farming - organic farming - principles and practices.	
Teaching-Learning Process	<ol style="list-style-type: none"> 1. PowerPoint Presentation 2. Chalk and Talk are used for Problem Solving (In-general) 3. Video demonstration or Simulations 4. Laboratory Demonstrations and Practical Experiments
Module-4	
FOOD PRODUCTION AND FOOD SECURITY: Performance of Major Food Crops over the past decades - trends in food production - Decline in total factor productivity growth - Demand and supply projections - Impact of market force - Rural Land Market - Emerging Water market - Vertical farming - Sustainable food security indicators and index - Indicator of sustainability of food Security - Path to sustainable development.	
Teaching-Learning Process	<ol style="list-style-type: none"> 1. PowerPoint Presentation 2. Chalk and Talk are used for Problem Solving (In-general) 3. Video demonstration or Simulations 4. Laboratory Demonstrations and Practical Experiments
Module-5	
POLICIES AND PROGRAMMES FOR SUSTAINABLE AGRICULTURE AND FOOD SECURITY Food and Crop Production policies - Agricultural credit Policy - Crop insurance - Policies of Natural Resources Use - Policies for sustainable Livelihoods - Virtual water and trade - Sustainable food Security Action Plan.	
Teaching-Learning Process	<ol style="list-style-type: none"> 1. PowerPoint Presentation 2. Chalk and Talk are used for Problem Solving (In-general) 3. Video demonstration or Simulations 4. Laboratory Demonstrations and Practical Experiments
Course outcome (Course Skill Set) At the end of the course the student will be able to : <ol style="list-style-type: none"> 1. Gain knowledge on the need for sustainable agriculture 2. Comprehend the need for food security on global level and the Nutritional Security. 3. Demonstrate how ecological balance is required for sustainability of agriculture. 	
Assessment Details (both CIE and SEE) The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50)in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together Continuous Internal Evaluation: Three Unit Tests each of 20 Marks (duration 01 hour) <ol style="list-style-type: none"> 1. First test at the end of 5th week of the semester 2. Second test at the end of the 10th week of the semester 3. Third test at the end of the 15th week of the semester 	

<p>Two assignments each of 10 Marks</p> <ol style="list-style-type: none"> First assignment at the end of 4th week of the semester Second assignment at the end of 9th week of the semester <p>Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for 20 Marks (duration 01 hours)</p> <ol style="list-style-type: none"> At the end of the 13th week of the semester <p>The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be scaled down to 50 marks</p> <p>(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).</p> <p>CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.</p>
<p>Semester End Examination:</p> <p>Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (duration 03 hours)</p> <ol style="list-style-type: none"> The question paper will have ten questions. Each question is set for 20 marks. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module. <p>The students have to answer 5 full questions, selecting one full question from each module</p>
<p>Suggested Learning Resources:</p> <p>Books</p> <ol style="list-style-type: none"> B.K.Desai and Pujari, B.T. Sustainable Agriculture : A vision for future, New India Publishing Agency, New Delhi, 2007. Saroja Raman, Agricultural Sustainability – Principles, Processes and Prospects, CRC Press, 2013 Swarna S.Vepa et al., Atlas of the sustainability of food security. MSSRF, Chennai, 2004. Sithamparanathan, J., Rengasamy, A., Arunachalam, N. Ecosystem principles and sustainable agriculture, Scitech Publications, Chennai, 1999. Gangadhar Banerjee and Srijeet Banerji, Economics of sustainable agriculture and alternate production systems, Ane Books Pvt Ltd., 2017 M.S.Swaminathan, Science and sustainable food security, World Scientific Publishing Co., Singapore, 2010.
<p>Web links and Video Lectures (e-Resources):</p>
<p>Activity Based Learning (Suggested Activities in Class)/ Practical Based learning</p> <ul style="list-style-type: none"> Quizzes Assignments Seminars Mini Projects


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