Educational programmes on ecosystem conservation

The university provides educational programmes on ecosystem such as Organic Farming, Environmental Studies, Soil and Water Conservation, and Integrated Pest Management emphasize hands-on training through field visits, farm demonstrations, and participatory rural learning.

- The Rural Agricultural Work Experience (RAWE) and vocational training programmes enable students to work directly with farmers, helping them adopt sustainable farming practices, improve soil health, and manage natural resources efficiently.
- Collaborations with NGOs like SURAKSHA and AGARANA provide farmers exposure to modern horticultural practices, organic farming techniques, nursery management, and post-harvest processing.
- Community outreach initiatives such as plantation drives, apiculture demonstrations, and awareness campaigns promote biodiversity conservation and environmental stewardship.
- The programs have significantly enhanced local capacities, enabling farmers to apply sustainable technologies, conserve water and soil, and diversify their livelihoods.
- Women's participation has been a key focus—over 45% of trainees in various training and outreach programs are women farmers and self-help group members, fostering inclusivity and empowerment.
- These initiatives strengthen the link between education, research, and community development while advancing the Sustainable Development Goals (SDGs 13 & 15) on climate action and life on land

- **List of Courses:**

Table 1: List of the courses related to educational programs from BSc Ag.

SI No.	Course Name	Course Credit
1.	Farming System and Organic farming for Sustainable Agriculture	ASAG3207
2.	Fruit and plantation crop cultivation	ASHO 2102
3.	Manures, Fertilizers and Soil Fertility Management	ASAC2202
4.	Production Technology for Ornamental Crops, MAPs and Landscaping	ASHO2204
5.	Introductory Agro-meteorology and climate change	ASAG1202

6.	Agricultural marketing and prices	ASEC2103
7.	Principles of Integrated Pest and Disease Management	ASAP3204
8.	Environmental studies and disaster management	ASES3101
9.	Rural Sociology & Educational Psychology	ASEE1101
10.	Post-harvest Management and Value Addition of Fruits and Vegetables	ASHO3205
11.	Weed management	ASAG2105

- **Domain and Skill courses offered:**

Table 2:Domain courses to be offered in 3rd & 5th semester

SEMESTER-III		
Course No	Course name	L-P-P
	Skill Enhancement course-V* (Students will be opted any one from the basket of nine courses)	2(0+2+0)
Centurion University 3206	Organic Production Technology	2(0+2+0)

Centurion University 3207	Mushroom Production Technology	2(0+2+0)
Centurion University 3208	Poultry Production Technology	2(0+2+0)
Centurion University 3209	Seed Production and Testing Technology	2(0+2+0)
Centurion University 3210	Biofertillser Production	2(0+2+0)
Centurion University 3211	Biopesticide Production	2(0+2+0)
Centurion University 3212	Soil, Plant and Water Testing	2(0+2+0)
Centurion University 3213	Horticulture Nursery Management	2(0+2+0)
Centurion University 3214	Beneficial Insect Farming	2(0+2+0)
ASEC 1202	Entrepreneurship Development and Business Communication	3 (2+1+0)
ASSW 2103	Physical Education, First Aid, Yoga Practices and Meditation	2(0+2+0)
ASPG 2101	Principles of Genetics	3(2+1+0)
ASAG 2103	Crop Production Technology-I (Kharif crops)	3(1+2+0)
ASHO 2102	Production Technology of Fruit and Plantation Crops	2 (1+1+0)
ASEE 2102	Fundamentals of Extension Education	2(1+1+0)
ASNE 2101	Fundamentals of Nematology	2(1+1+0)
ASAG 2104	Principles and Practices of Natural Farming	2(1+1+0)

Semester-V		
Course No	**Course name**	**L-P-P**
ASEE3103	Entrepreneurship Development and Business Communication	2 (1+1+0)
ASAC3103	Problematic Soils and their Management	2 (1+1+0)

ASEN3103	Pests of field Crops and Stored Grain and their Management	3 (2+1+0)
ASPP3103	Diseases of Field and Horticultural Crops and their Management-II	3 (2+1+0)
ASPG3104	Crop Improvement-I *(Cereals, millets, pulses and oil seeds etc.)(Kharif crops)*	2 (1+0+1)
ASAG3110	Geoinformatics and Nano-technology for Precision Farming	2 (1+1+0)
ASAG3108	Practical Crop Production – I (*Kharif* crops)	2 (0+0+2)
Three domain courses	Domain courses (3 subject from course)	9 credits (each of 1+2+0)

Table 3: Skill courses offered

DOMAIN	Course Code	Course Title	Credit
Centurion University		Smart Farm Machinery	9
1	CUFM2220	Product Development Brief	2
	CUFM2221	Sensor, Actuators and Robot Operating Systems	4
	CUFM2223	Piloting a Drone	3
Centurion University		Organic Farming	9
2	CUOF2230	Organic Farming	3
	CUOF2231	Certification and Inspection Systems in Organic Farming in India.	3
	CUOF2232	Biopesticides and Biofertilizers	3
Centurion University		Dairy Processing and Development	9
3	CUDP2240	Milk Processing in Dairy Industry	3
	CUDP2241	Dairy Starters in Fermented Milk Products	3
	CUDP2242	Quality Assurance in Dairy Industry	3
Centurion		Intensive Aquaculture	9

University			
4	CUAQ2250	Intensive Fish Rearing	3
	CUAQ2251	Ornamental Fish Farming	3
	CUAQ2252	Biofloc Aquaculture	3
Centurion University		Seed Production using Manual and Molecular Methods	9
5	CUSP2260	Breeding methods: Conventional and Molecular Approach	3
	CUSP2261	Seed Production of Vegetable and Cereals Crops	3
	CUSP2262	Seed Certification	3
Centurion University		Genetic Engineering & Genomics	9
6	CUGE2270	Computational Biology	3
	CUGE2271	Genetic Engineering and its applications	3
	CUGE2277	Genetics and Genomics	3
Centurion University		Nutraceuticals	9
7	CUNU2280	Introduction to Nutraceutical	3
	CUNU2281	Functional Food	3
	CUNU2282	Nutrigenetics	3
Centurion University		Smart Agriculture	9
8	CUAG2297	Raising crops under automated polyhouse	3
	CUAG2298	Soil-less farming and hydroponics technology	3
	CUAG2299	Smart irrigation and nutrient management	3
Centurion University		Protected Horticulture	9
9	CUPH2300	Applied Hi-tech Horticulture	3
	CUPH2301	Protected Cultivation of Vegetable Crops	3
	CUPH2302	High Tech Fruit Culture	3
Centurion University		Food Processing	9
10	CUFP2310	Processing Technology of Cereals and Millets	3
	CUFP2311	Processing Technology of Legumes and Oilseeds	3

	CUFP2312	Processing Technology of Fruits, Vegetables, Spices and Condiments	3
Centurion University		Agri Business Management	10
11	CUAB2320	Agri Food Markets and Value Chain Analysis	3
	CUAB2321	Agri Input Marketing	3
	CUAB2326	Principles of Management & Agribusiness	2
	CUAB2327	Agri Technology Management	2
Centurion University		Commodity and Food Storage	9
12	CUFS2330	Storage Entomology	3
	CUFS2331	Seed Pathology	3
	CUFS2332	Post-harvest Biochemistry and Physiology of Crops	3
Centurion University		Soil and Water Conservation through Watershed	9
13	CUSW2340	Rainwater Harvesting and Artificial Recharge	3
	CUSW2341	Integrated Watershed Management	3
	CUSW2342	Sustainable Watershed	3
Centurion University		Fish Processing Technology	9
14	CUFT2350	Post harvest handling and processing of fish and shellfish	3
	CUFT2351	Design, maintenance of fish processing plant and instrumentation	3
	CUFT2352	Quality assurance, management and certification	3
Centurion University		Health Care Assistancy	25
15	CUHC2382	Health Care Assistancy	4
	CUHC2384	Drug Abuse and Stress Management	3
	CUHC2385	Organization of Health Industries	5
Centurion University		Plant Tissue Culture & Vegetative Propagation	9
16	CUPT2420	Technologies of Plant Tissue Culture	3
	CUPT2421	Biotransformation using plant cells, organ cultures and enzyme systems	3

	CUPT2422	Vegetative Propagation – Methods and Techniques	3
Centurion University		Animal Cell Culture	9
17	CUAC2430	Stem Cell and Developmental Biology	3
	CUAC2431	Animal Cell Culture and its Application	3
	CUAC2432	Instrumentation of Animal Biotechnology	3

Link to courseware: http://courseware.Centurion University.ac.in/categories-courses/core-courses/

a) Farming System and Organic farming for Sustainable Agriculture (ASAG3207):

In the course "Farming System and Organic Farming for Sustainable Agriculture (ASAG3207)," students gain a comprehensive understanding of sustainable agriculture, emphasizing the critical roles of ecosystem services, biodiversity conservation, and resilience to climate change.

Figure 1: Student working in the allotted field

b) Fruit and plantation crop cultivation: ASHO 2102: Integration of theoretical knowledge with practical skills in fruit and plantation crop cultivation fosters a holistic understanding of sustainable agriculture practices.

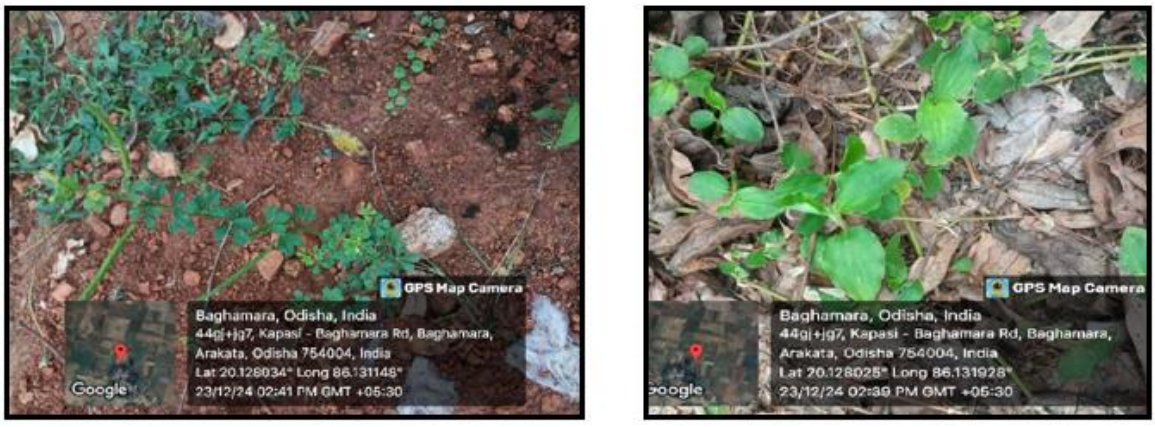

Figure 2: Shows land restoration

c) Manures, Fertilizers and Soil Fertility Management: ASAC2202: Hands-on experience with analytical instruments for soil and plant nutrient analysis (e.g., colorimetry, flame photometry) equips students with practical skills to assess soil fertility and make informed fertilizer recommendations.

Figure 3: Soil management practices

d) Production Technology for Ornamental Crops, MAPs and Landscaping: ASHO 2204: Hands-on experience in nursery bed preparation, seed sowing, plant propagation, and care and maintenance of protected structures (greenhouses, polyhouses) develops practical skills. Intercultural operations, training, and pruning techniques for ornamental plants and MAPs ensure optimal growth and yield. Practical sessions on garden planning, layout, and the use of trees, shrubs, and climbers in landscaping enhance understanding of aesthetic and functional landscaping principles.

Figure 4: Nursery management

e) Introductory Agro-meteorology and climate change: ASAG1202: The main objective of this course is to study about different climatic factors affecting crop growth and development, different weather aberrations, climate change, its cause and impacts. Students will be able to learn the impact of weather and climate on agricultural production systems.

Figure 5: Agrometeorology unit in Campus

f) Agricultural marketing and prices: ASEC2103: Practical exercises on plotting demand and supply curves, calculating elasticities, and studying price behaviour over time help students apply theoretical concepts to real-world data.

Figure 6: Market survey by students

g) Principles of Integrated Pest and Disease Management: ASAP3204: The objective of the course can prepare students to become skilled agricultural professionals capable of addressing global challenges in pest management while promoting sustainable agricultural practices aligned with the SDGs.

Figure 7: Pest and insect management

h) Environmental studies and disaster management: ASES3101: The objectives of the study is to understand the distinction between renewable (e.g., forests, water) and

non-renewable resources (e.g., minerals, fossil fuels) and their sustainable management practice. Exploring issues like deforestation, over-exploitation, and their impacts on biodiversity and local communities.

Figure 8: Alternate energy sources in the campus

i) Rural Sociology & Educational Psychology: ASEE 1101: Conducting field visits to rural areas to observe and analyze rural society characteristics, social stratification, community institutions (e.g., schools, cooperatives), and cultural practices. Administering psychological tests (e.g., Eysenck Personality Inventory, Edwards Personality Inventory) to assess farmer personalities, intelligence types, and learning preferences

Figure 9: Training and demonstration to farmer

j) Soil and Water Conservation Engineering: ASAE 1101: The objective of the course is to access the current state of soil conservation efforts in India involving conducting case studies and comprehensive field surveys.

Figure 10: Soil water conservation measures

k) Weed management: ASAG2105: Students learn to identify common weeds, which is

crucial for implementing appropriate control measures. This includes both broadleaf and grassy weeds. Various methods of weed control are studied, including cultural, mechanical, biological, and chemical approaches. Emphasis is often placed on integrated weed management (IWM) strategies that combine multiple techniques for sustainable control.

Figure 11:Weed management practices

Post-harvest Management and Value Addition of Fruits and Vegetables: ASHO3205: Integration of sustainable practices in post-harvest management and value addition, including reducing food waste, utilizing by-products, and minimizing environmental impact.

Figure 12: Post harvest product prepared by students

1. **The Rural Agricultural Work Experience (RAWE) programme:**
   It is a mandatory, immersive training module for B.Sc. (Agriculture) students in India implemented under ICAR's Student READY framework. Over approximately 90 days, students live in rural communities to conduct participatory rural appraisals (PRA), survey farm families, analyse cropping patterns and socio-economic conditions, and plan context-specific farm strategies.

Figure 13: Soil collection from villages for soil analysis and Demonstration of Grafting

Figure 14: Demonstration of organic nutrient

Figure 15: Preparation of Kitchen Garden

2. **World Environment Day on June 5th, 2024:** In celebration of World Environment Day on June 5th, 2024, Team CaSR, in collaboration with the Department of Horticulture, organized a plantation drive to promote environmental awareness and sustainability. The initiative aimed to encourage students and staff to contribute to a greener future by planting trees and embracing eco-friendly practices within the campus and surrounding areas.

3. **Van Mahotsav** 2024, a Plantation Drive was organized by the Range Forest Office, Devgiri Range, Paralakhemundi, in collaboration with NSS Unit, Centurion University-PKD, on 1st July 2024. A team of 25 enthusiastic NSS volunteers from Centurion University, Paralakhemundi actively participated in the event, planting several indigenous tree species to support local biodiversity.

4. On 28th July 2024, the NSS Unit of Centurion University, Paralakhemundi, organized a Plantation Drive at the Aquaculture Research Farm, Totagumuda, to commemorate World Nature Conservation Day. Under the guidance of NSS programme officers, 85 enthusiastic

volunteers planted numerous saplings aimed at restoring natural habitats, improving air quality, and combating climate change.

5. On 21 August, 2024 our 1st-year B.Sc. Agriculture, B.F.Sc, and M.Sc. Agriculture students, participants took part in the impactful "One Plant, One Person" initiative by planting Kadam saplings. Each student was assigned a sapling to nurture and care for throughout their four-year academic journey.

Figure 16: Glimpses of Plantation drive

6. On the occasion of **Teacher's Day,** the Agri flora Student's Society (CSAR) and NSS Unit of Centurion University organized a combined celebration and plantation drive on 5th September 2024 at Madhusudanpur Government Hi6.gh School, Gosani, Gajapati, Odisha.

Figure 17: Glimpses of NSS unit planting trees in nearby areas

7. Soil conservation Measures:

RAWE (Rural Agricultural Work Experience) students at Centurion University actively contribute to soil conservation through a variety of field-based initiatives during 2024. By conducting soil testing, they help farmers understand their soil health and recommend appropriate organic inputs to enhance fertility without harming the ecosystem. The students promote the use of sustainable practices such as vermicomposting, Azolla cultivation, and the application of Trichoderma to improve soil structure and microbial activity. They also guide farmers in preparing and using organic formulations like Panchagavya and Jeevamrita, which enrich the soil naturally.

Figure 18: Photos of students demonstrating organic nutrients to local farmers.

8. **A five-day residential training programme for Vocational Trainers (VTs)** was conducted from 20th June 2024 to 28th June 2024 at Centurion University , Paralakhemundi, one of the venues among the selected venues. 91 Vocational trainers were provided with suitable accommodation as well as food and refreshments inside campus. Special vehicles had been arranged for their transportation and visits to different units in the campus.

Figure 19: Glimpses from the training Programme.

9. **Apiculture Unit:**

   The apiculture unit played a proactive role in spreading awareness and practical knowledge through a series of training sessions and demonstrations. Demonstrations were conducted specifically for students, farmers, and visitors from different areas. The unit also featured a rural hut, which served as an interactive and informative space for the rural community to understand beekeeping practices.

Figure 20: Demonstration to ICAR visitors and school students

10. A One-day Training Programme on Commercial **Horticultural Farm and Nursery Management"** on 22nd August 2024 for the farmer trainees coming across Gajapati district in collaboration with SURAKSHA NGO. About 35 farmers are going to be trained under the above said training programme.

11. Training on Dragon fruit:

AGARANA NGO in Rayagada organized a training-cum-exposure visit for its progressive farmers to the campus. 15 farmers from Rayagada joined a capacity-building programme covering modules like mushroom and spawn production, organic farming practices, nursery development, and post-harvest processing, alongside hands-on exposure at Centurion University's commercial agri-based units — including the Spawn Unit, Mushroom Unit, Bakery, and Microbiology Lab

12. **Research By the students:**

M.S.c students contribute directly to educational programs aligned with SDG 15 (Life on Land) by translating their research on sustainable agriculture, such as crop breeding, integrated pest and soil health management, and agro ecological practices into practical outreach workshops, field training, and curriculum modules for farmers and communities. Centurion University integrate student-led crop trials and biodiversity projects into community education, while institutions globally embed SDG-based training in MSc courses (e.g. agronomy or genetics & plant breeding). These initiatives empower extensions like farmer field schools, seminars, and demonstration farms to promote sustainable land use and ecosystem stewardship.

Figure 21: Training on Dragon fruit

Figure 22: Students work in Experimental plot