Integral University, Lucknow

Effective from Session: 2020-21							
Course Code	AG509	**Title of the Course**	Production Technology of Cool Season Vegetable Crops	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	2	0	2	
Course Objectives	• To know about soil and climate requirement of cool season vegetables • To familiarize with different varieties and methods of sowing in different vegetables. • To attain knowledge of seed production technology of cool season vegetable • To impart knowledge of crop protection measure in different crops						

Course Outcomes	
CO1	The students will be able to know what are the basic criteria for selection of soil and climate for vegetable crops
CO2	The students can use the basic knowledge regarding different cultural practices followed for cool season vegetables
CO3	Students are able to know about sowing time of different varieties according to temperature
CO4	Study of irrigation and nutrient management and their applications in production vegetables
CO5	By the end of course students will be able to control of different insect pests.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Unit-I**	Introduction, botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post-harvest management, plant protection measures and seed production of Potato	5	CO1, CO2, CO3, CO4, CO5
2	**Unit-II**	Introduction, botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post-harvest management, plant protection measures and seed production of Cole crops: cabbage, cauliflower, knoll kohl, sprouting broccoli, Brussels sprout	9	CO1, CO2, CO3, CO4, CO5
3	**Unit-III**	Introduction, botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post-harvest management, plant protection measures and seed production of Root crops: carrot, radish, turnip and beetroot	6	CO1, CO2, CO3, CO4, CO5
4	**Unit-IV**	Introduction, botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post-harvest management, plant protection measures and seed production of Bulb crops: onion and garlic	5	CO1, CO2, CO3, CO4, CO5
5	**Unit-V**	Introduction, botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post-harvest management, plant protection measures and seed production of Peas and broad bean, green leafy cool season vegetables	5	CO1, CO2, CO3, CO4, CO5
		Cultural operations (fertilizer application, sowing, mulching, irrigation, weed control) of winter vegetable crops and their economics; Experiments to demonstrate the role of mineral elements, plant growth substances and herbicides; study of physiological disorders; preparation of cropping scheme for commercial farms; visit to commercial greenhouse/ polyhouse.	14	CO1, CO2, CO3, CO4, CO5

Reference Books:

- Rana MK. 2008. Olericulture in India. Kalyani Publication.
- Rana MK. 2008. Scientific Cultivation of Vegetables. Kalyani Publication.
- Singh DK. 2007. Modern Vegetable Varieties and Production Technology. International Book Distributing Co.
- Gopalakrishanan TR. 2007. Vegetable Crops. New India Publ. Agency.
- Bose TK, Kabir J, Maity TK, Parthasarathy VA & Som MG. 2003. Vegetable Crops. Volume: I-III. Naya Udyog.
- Chadha KL. (Ed.). 2002. Hand Book of Horticulture. ICAR.
- Bose TK, Som G & Kabir J. (Eds.). 2002. Vegetable Crops. Naya Prokash.
- Chadha KL & Kalloo G. (Eds.). 1993-94. Advances in Horticulture Vols. V-X. Malhotra Publ. House.
- Fageria MS, Choudhary BR & Dhaka RS. 2000. Vegetable Crops: Production Technology. Vol. II. Kalyani.

e-Learning Source:

https://youtu.be/mILQ34bgWNM

https://www.youtube.com/watch?v=ksa30zlEyQY

https://www.youtube.com/watch?v=RTezvUxNY3Y

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	2	2	3		3		1	1	3	3	2	3	2			
CO2	3	3	3	2	3	3	3				2	2	2	2	2			
CO3	3	3	2		3	1	3				3	2	2	2	2			
CO4	3	3	3	3		2	3				3	2	2	3	2			
CO5	2	3	3	2	2	2	2	3	3	2	3	3	2	2	2			

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Integral University, Lucknow

Effective from Session: 2020-21							
Course Code	AG505	**Title of the Course**	Production Technology of Underexploited Vegetable	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	2	0	2	
Course Objectives	• To know about origin, geographical distribution, soil and climate requirement of underexploited vegetable crops. • To familiarize with different improved varieties and methods of sowing in different under exploited vegetables. • To impart knowledge of various inter cultural operations and their management for under exploited vegetable crops. • To attain knowledge of crop protection measure in different under exploited vegetables.						

Course Outcomes	
CO1	The students will be able to understand about the basic criteria for selection of under exploited vegetable crops on the basis of soil and climate requirement.
CO2	The students will learn the basic knowledge regarding different cultural practices followed for underutilized vegetable crops
CO3	The students will be able to know about sowing time of specific varieties for different under exploited vegetables according to region and season.
CO4	The study of irrigation and nutrient management and their applications in production of under exploited vegetable crops
CO5	By the end of course students will be able to know different physiological disorders of under exploited vegetables and can control different insect pests and diseases.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Unit-I**	Introduction, botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post-harvest management, plant protection measures and seed production of Asparagus, artichoke and leek	5	CO1, CO2, CO3, CO4, CO5
2	**Unit-II**	Introduction, botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post-harvest management, plant protection measures and seed production of Brussels's sprout, Chinese cabbage, broccoli, kale and artichoke.	6	CO1, CO2, CO3, CO4, CO5
3	**Unit-III**	Introduction, botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post-harvest management, plant protection measures and seed production of Amaranth, celery, parsley, parsnip, lettuce, rhubarb, spinach, basella, bathu (chenopods) and chekurmanis.	8	CO1, CO2, CO3, CO4, CO5
4	**Unit-IV**	Introduction, botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post-harvest management, plant protection measures and seed production of Elephant foot yam, lima bean, winged bean, vegetable pigeon pea, jack bean and sword bean.	6	CO1, CO2, CO3, CO4, CO5
5	**Unit-V**	Introduction, botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post-harvest management, plant protection measures and seed production of Sweet gourd, spine gourd, pointed gourd, Oriental pickling melon and little gourd (kundru).	6	CO1, CO2, CO3, CO4, CO5
Practicals:				
Identification of seeds; botanical description of plants; layout and planting; cultural practices; short-term experiments of underexploited vegetables.			14	CO1, CO2, CO3, CO4, CO5

Reference Books:

- Bhat KL. 2001. Minor Vegetables - Untapped Potential. Kalyani.
- Indira P & Peter KV. 1984. Unexploited Tropical Vegetables. Kerala Agricultural University, Kerala.
- Peter KV. (Ed.). 2007-08. Underutilized and Underexploited Horticultural Crops. Vols. I-IV. New India Publ. Agency.
- Rubatzky VE & Yamaguchi M. (Eds.). 1997. World Vegetables: Principles, Production and Nutritive Values. Chapman & Hall.

e-Learning Source:

https://youtu.be/mILQ34bgWNM

https://www.youtube.com/watch?v=ksa30zlEyQY

https://www.youtube.com/watch?v=RTezvUxNY3Y

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	2	3	2		3				3	2	2	3	2			
CO2	2	2	1	2	2		2				2	2	3	2	3			
CO3	3	3	2		2	1	3				3	2	2	3	2			
CO4	3	2	2	2	2	2	2				1	2	2	2	2			
CO5	3	3	3	1	2	1	3				3	3	2	3	2			

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Integral University, Lucknow

Effective from Session: 2018-2019							
Course Code	PGS501	**Title of the Course**	Library and Information Services	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	0	0	2	
Course Objectives	• To study about the role of library in education, research and technology • To obtain idea of Intricacies of abstracting and indexing services and to enlighten the students about the computerized library services. • To give the knowledge of e resources and search engines						

Course Outcomes	
CO1	The students will gain the knowledge about the library importance in different sites.
CO2	They gain knowledge of Intricacies of abstracting and indexing services.
CO3	They know about the computerized library services.
CO4	To provide knowledge of e resources.
CO5	To give basic information about search engines.

Practicals:	**Contact Hrs.**	**Mapped CO**
Introduction to library and its services; Role of libraries in education, research and technology transfer; Classification systems and organization of library; Sources of information- Primary Sources, Secondary Sources and Tertiary Sources; Intricacies of abstracting and indexing services (Science Citation Index, Biological Abstracts, Chemical Abstracts, CABI Abstracts, etc.); Tracing information from reference sources; Literature survey; Citation techniques/Preparation of bibliography; Use of CD-ROM Databases, Online Public Access Catalogue and other computerized library services; Use of Internet including search engines and its resources; e-resources access methods.	28	CO1, CO2, CO3, CO4, CO5

Reference Books:

- Singh G. Information Sources, Services and Systems, 2013 Edition. Prentice Hall India Learning Private Limited
- Library Science, 2018 Edition. Ramesh Publishing House
- Subhankar Biswas, Durga Sankar Rath. Cataloguing in the New Era: Gazing through the Bodleian Catalogues to RDA, 2017 Edition. Ess Ess Publications

e-Learning Source:

https://www.youtube.com/watch?v=jQlGmtY3sUw (Role of libraries in education, research and technology transfer)

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	1	1	1	3	3	3	2	3	1	3	1	1	1			
CO2	3	3	1	3	3	3	1	3	2	3	3	2	1	1	1			
CO3	3	2	1	3	3	2	1	3	2	1	2	3	1	1	1			
CO4	3	2	1	3	3	3	1	3	2	2	3	3	1	1	1			
CO5	3	1	1	3	3	3	1	3	2	2	3	3	1	1	1			

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation