Online Learning in Agriculture: Providing Path to An Agri-Literate India

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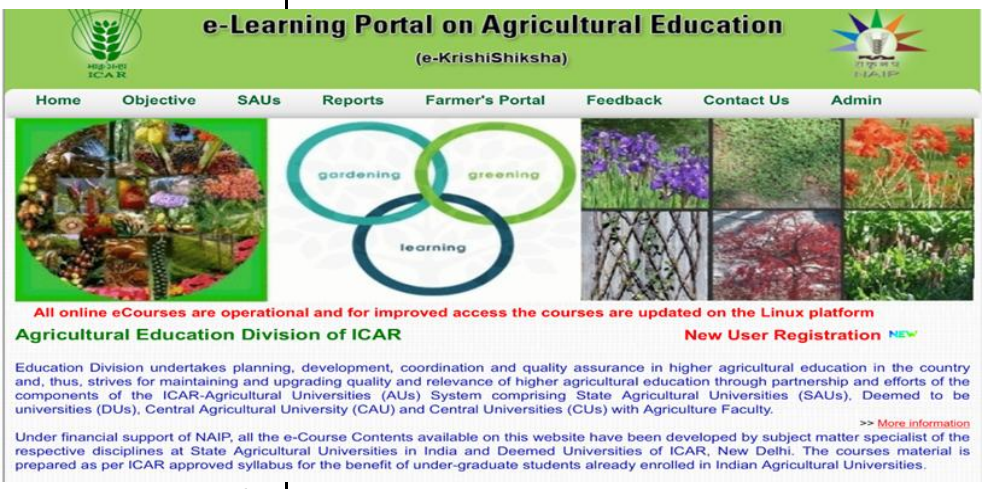
Agriculture not only means growing into a farmer. It is a blended perusal of learning food systems, natural resources, technology usage, marketing and developing organizations both public and private sectors.

Learning agriculture provide us with an opportunity to handle our future food system by ensuring food security and encouraging healthy environment. Up-skilling in agriculture has become necessary for matching pace with progressive technologies. Moreover, agriculture is also a promising career. So interested folks from other sectors are shifting to agriculture. But, gaining access to learning agriculture is scattered. ICT and digitalization have made learning concise. The bewitched people, both from farming as well as non-farming sector can get access to learn agriculture and allied practices of their choice through various online courses from different e-learning platforms. Government organizations, EdTech companies, Universities round the globe, research institutes are developing and delivering e-courses which can help the farming stakeholders, students and inquisitive mankind.

This article discusses about the online courses in agriculture and allied sectors that are easily accessible by the people from different corners of the country; their development, benefits and importance. Here, we have categorized the courses according to organizations offering them.



Source: www.ecourses.icar.gov.in

COURSES FROM GOVERNMENT INSTITUTIONS

e- Courseware on Agricultural Education (e-KrishiShiksha):

The Agricultural Education Division of ICAR with a joint partnership with its component institutes; ICAR-Agricultural Universities, State Agricultural Universities, Deemed-to-be universities, Central Agricultural Universities and Central Universities with

Source: www.ecourses.icar.gov.in

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Agricultural faculty has developed UG level interactive online course contents under NAIP's learning and capacity building programme. This portal allows round the clock access to content for teachers and students. The link to access the website is www.ecourses.icar.gov.in

Fig 1: Organizational Structure Network of e-KrishiShiksha

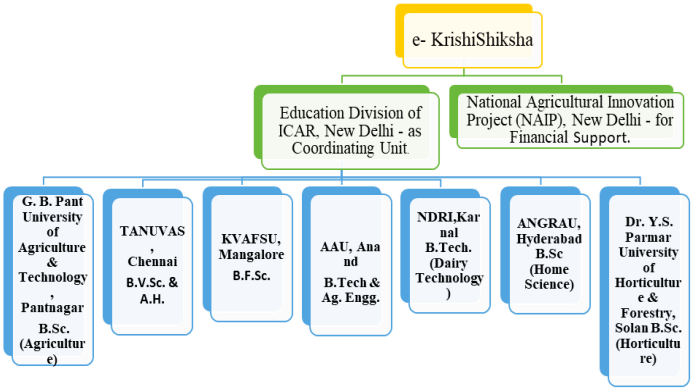

Table 1. Online UG courses offered by Agricultural Education Division of ICAR

S.No	Online e-Courses
1	B.Sc.(Agriculture)
2	B.V.Sc.(Veterinary & AH)
3	B.F.Sc.(Fisheries Science)
4	B.Tech. (Dairy Technology)
5	B.Sc.(Home Science)
6	B.Tech.(Agricultural Engineering)
7	B. Sc. (Horticulture)

Source: www.ecourses.icar.gov.in

Farmers e-World:

The Farmers e-world portal compiles e-resources generated at ICAR and SAUs, connecting farmers with the existing community. Interested person can use the e-learning platform for free. The new user needs to register on the portal, providing basic personal information for establishing Portal usage records. The link to access the portal is: (https://ecourses.icar.gov.in)

Digital Training programmes offered by NDDB (National Dairy Development Board):

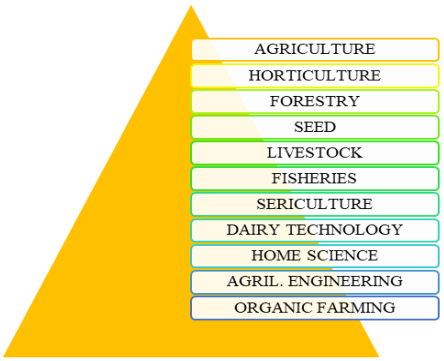

Fig. 2. Disciplines covered by Farmers e- World portal

Source: www.ecourses.icar.gov.in

NDDB has conceived to metamorphose capacity building and knowledge dissemination through digital platform to provide assistance and reach out to stakeholders in Indian dairy sector. The NDDB YouTube channel (www.youtube.com/c/NationalDairyDevelopmentBoard/videos), Dairy Knowledge Portal (www.dairyknowledge.in) and e-learning portal (www.nddb.coop) are to be accessed by users for receiving online content.

Online Course from Directorate of Open and Distance Learning, TNAU

Fig 3. Certificate Courses provided by Directorate of Open and Distance Learning, TNAU.

Source: https://tnau.ac.in/

Digital certificate courses conducted fully in English are offered to interested folks from any sector for a duration of 2 months and course fee of Rs. 3000, by the Directorate of Open and Distance Learning, TNAU, Coimbatore. The link of the portal is https://tnau.ac.in/ .

COURSES OFFERED THROUGH DIFFERENT MOOCS PLATFORM

MOOCs provide a flexible and economical way to osmose a new skill for career advancement and conceive good quality education, where anyone can register to access the e-courses.

agMOOCs

agMOOCs under NPTEL is pivoted towards training and capacity building of students and professionals indulged in different arenas of agricultural education. It is delivered by the Commonwealth of Learning and a Consortium of leading institutes of India; IIT Kanpur, IIM Calcutta and UAS- Raichur. It intends to deliver knowledge on critical topics to agricultural professionals in English and Hindi. Certificates are awarded to learners with good test scores.

Table 2. List of popular agMOOCs courses

Title of the MOOCs	URL of the course
Agricultural Value Chain Management	https://www.agmoocs.in/course/ag243-agricultural-value-chain-management
Fundamentals of ICT for Agriculture	http://hdl.handle.net/11599/2982
Basics of Entrepreneurship	https://www.agmoocs.in/course/ag393a-basics-entrepreneurship-development-agriculture
Fundamentals of Agricultural Extension	https://www.agmoocs.in/course/fage2021sept
GIS in Ag-essentials and Applications	https://www.agmoocs.in/course/gis-ag-essentials-and-applications
Integrated Disease Management	https://www.agmoocs.in/course/ag364b-integrated-disease-management
Integrated Pest Management	https://www.agmoocs.in/course/ipm2020
Weather forecast in Agriculture and Agro-advisory	https://www.agmoocs.in/course/ag212-weather-forecast-agriculture-and-agro-advisory

EdX platform

An American based MOOCs, developed jointly by Harvard University and MIT, hosts numerable online courses in agriculture for free. These courses can be accessed by students worldwide. The courses offered are enlisted below. The link of the website is: www.edx.org

Table 3. List of courses based on Agriculture and allied topics on EdX platform

Course Name	Offered by
Drainage in Agriculture: controlling water and salt levels in the soil	Wageningen University and Research
Feeding a Hungry Planet: Agriculture, Nutrition and Sustainability	SDG Academy
Drones for Agriculture: Prepare and Design Your Drone (UAV) Mission	Wageningen University and Research
Understanding Agribusiness, Value Chains, and Consumers	The University of Adelaide
Sustainable Agribusiness	Doanex
Sustainable Food Systems: A Mediterranean Percept	SDGAcademy
Sustainable Food Security: Crop Production	Wageningen University and Research
Agricultural Economic Modeling Tools	Doanex
Sustainable Agri-food Marketing	Doanex
Sustainable Agribusiness Comprehensive Exam	Doanex
Sustainable Global Food Systems	The University of Edinburgh
Global Food Futures and Agri-food Systems Solutions	Doanex
Innovative Environmental Management Models: Case Studies and Application	UMCES, USMx
e-Learning on Digital Agriculture	Open Learning Campus, The World Bank Group
Animal Breeding and Genetics	Wageningen University and Research

Irrigation Efficiency: more food with less water	KU LEUVEN
Sustainable Business Models: Guidance for Future Farmers	KU LEUVEN

Source: www.edx.org

Coursera

USA based MOOCs founded in 2012 by the Stanford University. It works in collaboration with universities and other organisations to deliver online courses with proper certifications. The link of the platform is: www.coursera.org

Table 4. List of popular courses in agriculture provided by Coursera

Course Topic	Offered by
Agriculture, Economics and Nature	University of Western Australia
Global Post harvest Loss Prevention: Fundamentals, Technologies and Actor	University of Illinois at Urbana-Champaign
Discover Best Practice Farming for a Sustainable 2050	University of Western Australia
Sustainable Agriculture Land Management	University of Florida
Challenges of Agribusiness Management	University of Bocconi
Geographic Information Systems (GIS)	University of California, Davis
Transformation of Global Food System	University of Copenhagen

Source: www.coursera.org

Udemy

A MOOCs platform founded in 2010; headquartered at San Francisco, California, providing professional courses to improve job- oriented skills with valid certifications being accepted world-wide. Some courses related to agriculture available at Udemy are listed below.

Table 5. List of popular courses in agriculture provided by Udemy

Course topic	Offered by
Growing Mushrooms Indoors for Business and Pleasure	Alex Field (Urban Farming Consultant, Entrepreneur)
Introduction to Precision Agriculture	Derek Arbeiter (Instructor, Technical Precision Technologies)
Bio-Organic Farming and Gardening: GROW Your Own FOOD	im Simpl (Environmental Engineer/ Organic Farmer/ Builder/ Designer)
Modern Farming Techniques	Dionisio Gonzalez (Project Engineer)
Agriculture Business Technology	Eric Yeboah (MBA/ Chief Executive Officer)
Aquaponic Farming. Design your own Aquaponics System	Dr. Gowhar Ali
Farming Business Finances	Eric Yeboah (MBA/ Chief Executive Officer)

SWAYAM (Study Webs of Active-Learning for Young Aspiring Minds)

This Indian MOOCs launched by MHRD, GOI and AICTE under Digital India, in 2017 providing a coordinated platform to web courses for free, covering advance education and skill enhancement in agriculture.

Table 6. List of popular courses in agriculture provided by SWAYAM portal

Course Name	Course Level	Course Duration
Indian Agricultural Development (MNR 001)	PG	15 weeks
Entrepreneurship Development	UG	12 weeks
Research Methodology	PG	12 weeks

Source: SWAYAM portal

Online courses from global universities

The digital courses from global universities awarding diploma and certifications in various domains of agriculture are mentioned below:

Table 7. List of popular courses in agriculture provided by global universities

Course Name	Offered By	Accredited By	Course Type
Agriculture Systems Management Technical Diploma	Madison Area Technical College	Higher Learning Commission	Diploma
Organic Agriculture	Washington State University	Northwest Commission on Colleges and Universities	Certificate
Professional Development in Urban Agriculture	University of Illinois at Urbana-Champaign	Higher Learning Commission	Certificate
Agricultural Technician Certificate	Lakeshore Technical College	Higher Learning Commission	Certificate

Source: onlineschoolcenter.com

Benefits of Online Learning

More Fun: Designing a course to make it fun and interactive by using multimedia or newly developed gamification methods, increases the lifetime and engrossment factor of courseware.

No restriction: Time and locational constraints are the significant threats faced by learners and teachers in learning. Online learning is flexible for everyone ready to attend a course.

Fairly priced: While books frequently become obsolete after certain time, online courses do not require the accession of new editions on a regular basis.

Befitting into context: Internet is a necessity now, as the learning organisations employ technologies enhancing efficiency. Transnational organisations face difficulty in working with people from other countries. Online learning tackles all challenges in training all such parties together.

Drawbacks of Online Learning

Sense of isolation: Despite the convenience, flexibility and opportunity of attending classes from anywhere at any time, learners may feel isolated. The course developers and coordinators should integrate with students by using video conferencing platforms and discussion forums.

Health related issues: Learners faces eye problems and physical issues due to more screen time. Therefore, it is important to deliver instructions on proper sitting posture and resting patterns.

Technical issues: The online lessons are mostly disrupted due to lack of good quality internet connection and access to advance smart gadgets all over the globe.

Training programmes for instructors: Lack of expertise of teachers in handling online courses disrupts learning. Hence they must be trained properly to tackle the technical issues, lecture capture software and LMS.

Conclusion

The 21st century Agriculture is mainly concerned with food security and sustainability due to the climatic changes and natural disasters. The changes in the natural resources and the mistakes of 20th century agriculture have made mankind to focus

on attaining sustainability. Technological advancement has even cropped into this sector. The use of Artificial Intelligence (AI) to combat nature's unpredictability is gaining popularity in agriculture.

The urge to up-skilling the agricultural practices is at hype with rapid development of agricultural sector. Both farming and non-farming communities are keenly interested in gaining knowledge about various aspects of agriculture. With the aura of digitalisation of education, e-learning approach is getting popular in agriculture. The Governmental organisations, Ed-Tech companies and MOOCs platforms deliver several online courses in agriculture and allied sectors, enabling learners to access from anywhere, anytime. The crucial time of COVID-19 has shown the importance of online learning. Despite the limitations, the benefits outweigh the pitfalls. These e-courses reaching interested pupils globally, blended with traditional education is committed to bring a smarter learning approach to agriculture.

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