Indian Institute of Technology, Kanpur

Proposal for a New Course

1. Course No: **DES6XX**
2. Course Title: **Design of Agricultural Farms and Cropping Systems**
3. Per Week Lectures: **3**, Tutorial: **0**, Laboratory: **0**, Additional Hours[0-2]: **0**,

   Credits: **9** Duration of Course: **Full Semester**
4. Proposing Department/IDP: **Department of Design**

   Other Departments/IDPs which may be interested in the proposed course: Department of Management Sciences, Economic Sciences, Kotak School of Sustainability

   Other faculty members interested in teaching the proposed course: N/A
5. Proposing Instructor(s): **Mainak Das**
6. Course Description:

   Agricultural food systems have evolved over centuries to ensure food and nutritional security. An agricultural farm is the basic unit of this food production system that involves natural, economic, social, and technological factors. The complex interactions among these factors must be understood to ensure the successful design of agricultural farms and achieve self-sufficiency in food production. The course aims to provide a comprehensive understanding of the evolution of farm design throughout the ages, in light of the technological knowledge and resources available at the time. This course is of immense significance for designing food security systems worldwide and for promoting agricultural entrepreneurship in the evolving global environment.

   A) Objectives:

   a. To understand the fundamentals of farm design and cropping patterns
   b. To evaluate the role of farm design in the agro-industrial ecosystem

c. To analyse the complex interplay of factors governing the dynamic machinery of a farm

d. To design farms with the intent of creating regenerative food production entities

B) Contents (*preferably in the form of 5 to 10 broad titles)*:

S. No	Broad Title	Topics	No. of Lectures
1.	**Farm Design**	a. Introduction to farm design and its importance in agriculture b. Principles of farm design	5
2.	**Farming: An Industry**	a. Farm turnover b. Dependence on natural factors c. Size of production unit and standardization of practices d. Human factors and organizational constraints e. Decision making	5
3.	**Classification of Farming**	a. Farming systems b. Farming types c. Factors determining types of farming	5
4.	**Farm Layout**	a. Requisites of ideal farm layout b. Field layout c. Farm fencing	5
5.	**Farm Labour**	a. Organization and selection of labour on farm b. Labour efficiency	5

6.	**Farm Records and Maintenance**	a. Objectives of farm records b. Key records on farm and maintenance	5
7.	**Cropping Systems**	a. Concept of cropping and farming systems b. Types of cropping and farming systems c. Interaction of cropping systems with farm resources and environment d. Components of cropping systems e. Economics and driving force of cropping systems	5
8.	**Cropping Pattern Design**	a. Introduction to cropping pattern design b. Factors affecting cropping pattern design	5
Total lectures			40

C) Pre-requisites: None

D) Short summary for inclusion in the Courses of Study Booklet:

The design of farms and cropping patterns is central to food production, where natural, economic, social, and technological factors work together to ensure food and nutritional security. This course provides a comprehensive understanding of the fundamentals of farm design and cropping patterns from a systems perspective in an agro-industrial ecosystem. It aims to train students to design farms as regenerative entities

7. Recommended books:

Textbooks:

1. Farm Management: Principles and Strategies by Kent Olson
2. Farm Business Management: The Fundamentals of Good Practice (Farm Business Management Series) by Peter L. Nuthall

3. Farm Management by Ronald D. Kay, William M. Edwards, Patricia A. Duffy
4. Principles of Farm Management by John Norman Efferson
5. *Farm Management* by R K Tandon and S P Dondhyal
6. Cropping Systems in the Tropics -Principles and Management by S.P. Palaniappan and K Sivaraman
7. Cropping and Farming Systems by S C Panda

Reference Books:

8. Any other remarks: None

Dated: May 4 2026 Proposer: Mainak Das

Dated:_____ DUGC/DPGC Convener:_____

The course is approved / not approved

Chairman, SUGC/SPGC

Dated:_____