

Документ подписан простой электронной подписью
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Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA NAMED AFTER PATRICE
LUMUMBA
RUDN University

Agrarian and Technological Institute

(educational division (faculty/institute/academy) as higher education programme developer)

COURSE DESCRIPTION

The study of disciplines is carried out within the framework of mastering the main professional educational program of higher education:

General Agronomy

(field of studies / speciality code and title)

implemented in profile/specialisation:

35.04.04 Agronomy

(higher education programme profile/specialisation title)

Course Title		Russian as a foreign language	
Course Workload		6 credits (216 hours)	
CONTENT OF THE DISCIPLINE			
Section number	Course Title section	Section (Topic) Contents	
Section 1	General characteristics of the subject	1.1	Component composition of the item. The full composition of the subject. Incomplete component composition of the subject. The presence / absence of a component in the structure. The combination of the components of the subject. Item location. The orientation of the subject in space. The way the location of the item.
		1.2	Qualitative and quantitative composition of the subject. Qualitative composition of the subject. Qualitative and quantitative composition of the subject.
		1.3	Properties, shape and surface relief of an object. Object properties. The shape of the object. The surface relief of objects.
Section 2	Subject and its basic signs	2.1	Qualitative characteristics of the subject. The color of the object. The taste and smell of the object. Consistency of the object. Object properties.
		2.2	Quantitative characteristics of the subject. The numerical value of the size, size, weight of the object. Fluctuations in the size of an object. The maximum size of the object. Exceeding an object of a certain size.
		2.3	Function of the subject. Function identification. The essence of the function. Conditionality of the function of the subject.
		2.4	Classification of the subject. Classes of objects. Classification attribute and object classes. Representatives of the class of the subject.
Section 3	Key signs and characteristics of the process	3.1	General characteristics of the process. The essence of the process. The presence of the process, distributors with the value of the circumstantial characteristics of the process. Types (types, forms) of the process. Carriers of the process.
		3.2	Stage of the process. The presence and number of process steps. The sequence of stages of the process and the place of the stage in the process. The processes occurring at each stage. The duration of the stage.
		3.3	Conditioning of the process. The connection between the process and the factor. Factor reason. Factor condition. The nature of the influence of the factor condition on the process.
Section 4	Life of a biological organism and its characteristics	4.1	Change in the qualitative and quantitative characteristics of an object (object, microorganism). Changing the characteristics of an object. Resize an object. Change the shape of an object. Change the color of an object.
		4.2	The appearance of the object and its death. The formation of the objects. The disappearance (termination) of objects.
		4.3	Change of location of an object and process dynamics. The nature and direction of movement. Fluid movement. Change in the intensity of processes. Change of the frequency of processes.

	4.4	The role and significance of the process. Assessment of the process in terms of importance, significance. Assessment of the process in terms of benefits or harms.
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Course Title	Information Technology
Course Workload	3 credits (108 hours)

CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. The role of information technology in the development of modern society. The concept of an information system (IS).	Topic 1.1. Brief historical background. Information and management. Basic processes of information transformation. Stages of information technology development. Computer information technologies and their types.
	Topic 1.2. The main purpose of information systems. Needs of information systems. Synthesis and decomposition of IS. IS models. IS life cycle.
	Topic 1.3. Geographic information systems. Information technologies. Types of information technologies.
Section 2. Storage structures and access methods	Topic 2.1. Data processing systems (DPS). File systems for data processing and their development trends. Data structures for DPS and access methods.
	Topic 2.2. Model of a simple sequential file. Index organization of a file. Search methods in an index. Organization of direct access. Hashing algorithms.
	Topic 2.3 Handling Overflows. List Organization. Binary Tree. Balanced Trees. B-Tree.
Section 3. Evolution of development of information systems and databases	Topic 3.1. Early approaches to database organization. Systems based on inverted lists, hierarchical and network DBMS.
	Topic 3.2. Strengths and weaknesses of early systems. Main features of systems based on inverted lists. Data manipulation.
	Topic 3.3. Hierarchical data structures. Data manipulation. Integrity constraints. Network systems
Section 4. The concept of databases (DB).	Topic 4.1. Basic concepts of databases. DB properties. Requirements for DB organization. Data bank. Components of the data bank. Data bank administrator. Database management system (DBMS). Levels of data presentation.
	Topic 4.2. Database life cycle. Database design process. Top-down design principle with successive iterations. Project expertise. Requirements analysis.

Course Title	Plant growing
Course Workload	18 credits (648 hours)

CONTENT OF THE DISCIPLINE		
Section number	Course Title section	Section (Topic) Contents
	Theoretical foundations	1.1 Plant biology and conditions of genotype formation. Classification of field crops. Fundamentals of physiological-genetic theory of productivity: PAR resources and potential harvest; solar energy accumulation and PAR efficiency

Section 1	of plant growing	1.2	Phytometric indicators of crops of a given productivity; determination of possible yields based on moisture supply and heat resources; agrochemical principles programming of crops
Section 2	Cereal crops of groups I and II	2.1	General characteristics of grain crops: morphology, biology, classification. Structure and chemical composition of grain. Features of organogenesis; phenology. The importance of heterotic and short-stemmed forms and varieties
		2.2	Cultivation areas and yield dynamics in the world and individual countries. Wheat taxonomy. Comparative biological and economic characteristics of soft and hard wheat. Spring and winter forms. Strong wheat. Winter wheat. Ways to improve winter hardiness. Features of plant growth in the autumn and spring-summer periods of vegetation. Technology of winter wheat cultivation. Zonal and varietal agricultural technology of wheat. Winter wheat in irrigated agriculture
		2.3	Spring and winter barley. Main directions in growing and using barley. Comparative characteristics biology and methods of spring and winter barley culture. Features of growing malting barley
		2.4	Corn. The most important food, feed and industrial crop. Agrotechnical importance of corn. Main cultivation areas and dynamics productivity. Biological foundations of culture. Comparative biological and economic characteristics of the most important subspecies of corn. Cultivation technology in different climatic zones at growing for grain and green mass. The role of hybrid forms in increasing the productivity and quality of corn grain. Combined corn crops with grain and leguminous crops.
Section 3	Cereal legumes	3.1	The role of grain legumes in increasing the production of vegetable protein for food and feed purposes. Agrotechnical significance of grain legumes. Distribution and productivity. Botanical and economic classification. Biological and ecological characteristics of grain legumes. Crops of the temperate, subtropical and tropical zones, comparative characteristics of cultivation techniques
		3.2	Soybean. The importance of soybean as a protein and oil crop. Dynamics of sowing areas and productivity, prospects for expansion in new, non-traditional areas (temperate zone). Botanical and biological Characteristics. Features of zonal agricultural technology of crops

		3.3	Beans. Origin and history of culture. Classification. Botanical and biological characteristics of the most important species of new and Old World. Features of agricultural technology of individual species
		3.4	Peas. Food and feed value. Cultivation zones. Botanical and biological characteristics. Cultivation techniques in different soil and climate conditions zones
Section 4	Oilseeds	4.1	National economic importance of oil crops. Classification and botanical characteristics. Biochemical characteristics of vegetable oils. Cultivation areas, sown areas, yield of main crops oilseeds (average and potential)
		4.2	Sunflower. Origin and history of culture, distribution and productivity. Russia's priority in oilseed crops sunflower. Botanical characteristics and classification. Biological features. Sunflower promotion to subtropical and tropical zones. Cultivation techniques
		4.3	Cruciferous oilseeds. Rapeseed, turnip rape (winter and spring forms), blue and white mustard. National economic importance. Distribution. Comparative morphological and biological characteristics. Features of agricultural technology of winter and spring forms.
Section 5	Sugar crops	5.1	The most important sugar crops of the world. Distribution and importance in the total gross production of sugar. Prospects and economic efficiency
		5.2	Sugar beet. Origin and distribution, botanical characteristics. Biological features. Comparative characteristics of methods of cultivation of factory and seed beets
Section 6	Starchy crops	6.1	Starchy crops are a source of carbohydrate nutrition. Botanical and economic classification. Plant response to changing environmental conditions. Theory tuberization. Biochemical characteristics
		6.2	Potatoes are the most important starchy crop in the world. Origin, distribution and productivity. Economic classification and biological characteristics. Causes of potato degeneration and methods of obtaining healthy planting stock material. Potato agrotechnics in different climatic zones
		7.1	Cotton is the world's main fiber crop. Origin. Main growing areas and productivity. Indicators qualities of cotton fiber. Botanical characteristics of the main types of cotton. Biology of culture. Development phases, flowering and fruit formation features. Features agricultural technology

Section 7	Fiber crops	7.2	Flax is a fibrous oil crop. Regions of cultivation of fiber and oil flax. Classification. Botanical and biological characteristics. Agricultural technology of flax and oil flax. Primary processing of flax
		7.3	Hemp is a versatile crop use. Prospects, morphology, biology and ecology of culture. Features of agricultural technology and primary processing
Section 8	Seed science	8.1	Seed science as an independent science and its connection with plant growing. Requirements, requirements for seed quality. Organization of seed control service in Russia and abroad. Structure of the International Seed Inspection Association (ISTA), participation of the State Seed Inspection of Russia in the work of ISTA
		8.2	Formation and development phases of seeds. Physiological and biochemical processes of filling and ripening of seeds. The relationship between nutritional and storage organs of plants. Heterogeneity of seeds. Ecological and agrotechnical conditions for growing high-quality seeds
		8.3	Morphological features and physical properties of seeds. Scientific basis for seed cleaning. Methods of preparing seed material for sowing
		8.4	Field germination of seeds and ways to improve it. Factors Affecting Field Germination of Seeds. Agricultural Technology and Field Germination
		8.5	Methods for determining the sowing qualities of seeds. Methods of selecting an average sample. Purity seeds. Fractional composition and weight of 1000 seeds. Laboratory germination and germination energy. Seed viability. Sowing suitability. Registration of documents on sowing qualities of seeds

Course Title	Soil Fertility Management
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Course Workload	16 credits (576 hours)
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CONTENT OF THE DISCIPLINE

Section number	Course Title section	Section (Topic) Contents	
Section 1	Introduction to Soil Science with Basics of Geology	1.1	The subject and history of soil science with the basics of geology.
Section 2	Soil-forming process and factors of soil formation	2.1	Formation of soil, its place in the structure of the earth's surface.
		2.2	Soil formation factors.
Section 3	Soil compositions.	3.1	Phase composition of soil. Granulometric composition of soil.
		3.2	Mineralogical and chemical composition of the soil.
		3.3	Organic composition of soil. Biological phase of soil
Section 4	Structure of the soil profile. Morphological soil characteristics.	4.1	Structure of the soil profile. Morphological features of soil. Field survey of soil profile.

Section 5	Physicochemical soil properties.	5.1	Soil colloid. Absorption capacity of soil.
		5.2	Soil acidity and alkalinity. Buffering capacity of the soil.
		5.3	Oxidation-reduction properties of soils. Enzymatic properties of soils. Allopathic properties of soils.
		5.4	Magnetic and radioactive properties of soil. Instrumental survey of soil cover.
Section 6	Soil regimes.	6.1	Water, air, thermal, chemical (WAT) soil.
Section 7	Soil fertility. Soil cover degradation. Agroecological characteristics.	7.1	Soil fertility.
		7.2	Soil erosion. Conditions and factors of soil cover degradation.
		7.3	Agroecological characteristics of soils.
Section 8	Genesis, classification, geography and agricultural soil use.	8.1	Soil classification. Soil-geographical zoning.
		8.2	Postlithogenic trunk soils.
		8.3	Soils of synlithogenic trunk.
		8.4	Soils of the organogenic trunk. Incompletely developed soils, trunk of chemogenic soils, outcrops and TPO.
Section 9	Soil cartography and its practical application application.	9.1	Soil cartography, its tasks and methods research. Specialized soil maps.
		9.2	Agro-industrial group and Soil grading. Soil-ecological index and its calculation.

Course Title	Mechanization of plant growing
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Course Workload	3 credits (108 hours)
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CONTENT OF THE DISCIPLINE

Section number	Course Title section	Section (Topic) Contents	
Section 1	General Provisions	1.1	History of the development of mechanization in agriculture
		1.2	Integrated mechanization of crop production
Section 2	Energy resources in crop production	2.1	Classification of agricultural tractors
		2.2	General structure of agricultural tractors
		2.3	Self-propelled agricultural machinery
Section 3	Technologies and technical means for soil cultivation	3.1	Technologies and tools for primary tillage
		3.2	Technologies and tools for surface tillage
Section 4	Technologies and technical means for sowing and planting agricultural crops	4.1	Technologies of sowing and planting agricultural crops
		4.2	Types, general structure and operating principle of continuous seed drills
		4.3	Types, general structure and operating principle of precision seeders
		4.4	Types, general structure and operating principle of potato planting and transplanting machines

Section 5	Technologies and technical means for the care of crops and plantings of agricultural crops	5.1	Basic techniques and technologies for caring for crops and plantings of agricultural crops
		5.2	Types, general structure and operating principle tools for inter-row tillage of crops and plantings of row crops
		5.3	Types, general structure and operating principle of machines for chemical control of weeds, diseases and pests in agricultural crops
Section 6	Technologies and technical means for harvesting agricultural crops	6.1	Technologies for harvesting grain crops, corn and sunflower for grain
		6.2	Types, general structure and operating principle of grain harvesters
		6.3	Potato harvesting technologies
		6.4	Types, general structure and operating principle of potato harvesting equipment
		6.5	Technologies for harvesting open-ground vegetables
		6.6	Types, general structure and operating principle equipment for harvesting open-ground vegetable crops
		6.7	Feed preparation technologies
		6.8	Types, general structure and operating principle of equipment for harvesting grass for hay
		6.9	Types, general structure and operating principle of equipment for harvesting grass for haylage
		6.10	Types, general structure and operating principle of forage harvesting equipment
Section 7	Technologies and technical means for application of fertilizers	7.1	Types and technologies of application of organic and organo-mineral fertilizers
		7.2	Types, general structure and operating principle of machines for applying solid and liquid organic fertilizers
		7.3	Classification and technologies of application of mineral fertilizers
		7.4	Types, general structure and operating principle of machines for applying mineral fertilizers
Section 8	Technologies and technical means for post-harvest processing and storage harvest	8.1	Post-harvest processing and storage technologies
		8.2	Types, general structure and operating principle of machines for post-harvest processing and storage of crops
Section 9	Basics of operation of machine and tractor units in crop production	9.1	Technical and economic indicators of the operation of machine and tractor units
		9.2	Assembly of machine and tractor units

Course Title	Pests and diseases of plants
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Course Workload	7 credits (252 hours)
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CONTENT OF THE DISCIPLINE

Section number	Course Title section	Section (Topic) Contents	
Section 1	General Entomology	1.1	Subject and history of entomology
Section 2	Agricultural entomology	2.1	Subject and history of entomology
		2.2	General plan of the structure of insects
		2.3	Anatomy and Physiology of Insects
		2.4	Lower insects and insects with incomplete metamorphosis. General characteristics of the orders
		2.5	Insects with complete metamorphosis. General characteristics of the orders

Section 3	General Phytopathology	3.1	Viruses and viroids as pathogens plants. Viruses of agricultural crops
		3.2	Bacteria as pathogens of plants. Bacterioses of agricultural crops
		3.3	Lower fungi as pathogens of plants
Section 4	Agricultural phytopathology	4.1	Higher fungi as pathogens of plants. Mycoses of agricultural crops
		4.2	Diseases of grain and leguminous crops
		4.3	Diseases of vegetable and fruit crops
Section 5	Control methods	5.1	Methods of diagnostics of fungal, bacterial and viral diseases of plants
		5.2	Methods of combating plant diseases
		5.3	Methods of plant pest control
Section 6	Methodological section	6.1	Working with the determinant
		6.2	Working with electronic databases

Course Title	Selection and seed production
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Course Workload	7 credits (252 hours)
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CONTENT OF THE DISCIPLINE

Section number	Course Title section	Section (Topic) Contents	
Section 1	Selection as a science of breeding methods varieties and hybrids	1.1	Selection as a science and a branch of agricultural production. Implementation of achievements of selection in seed production.
		1.2	Economic importance of selection. The founders of domestic selection and outstanding breeders.
Section 2	The doctrine of variety	2.1	The concept of a variety and a heterotic hybrid. Morphological and economic biological characteristics and properties of the variety. Energy-saving and ecological function of the variety.
		2.2	Varieties of folk selection. Selective varieties.
		2.3	Variety and agricultural technology: cultivation on different agricultural backgrounds; variety as an effective protection against diseases and pests; the role of variety in increasing quality of agricultural products
Section 3	Source material in selection	3.1	The concept of the source material for selection. N.I. Vavilov, his role in the doctrine of the source material.
		3.2	Centers of origin of cultivated plants. Peasant varieties as source material for selection.
		3.3	World collections of VIR, their use. Gene banks.
Section 4	Hybridization	4.1	The concept of analytical and synthetic selection.
		4.2	Intraspecific hybridization. Selection of pairs for crossing. Methodology and technique hybridization.
		4.3	Distant hybridization. The importance and difficulties of distant hybridization. Methods of overcoming incompatibility in distant hybridization. Methods of genetic and chromosome engineering and biotechnology in distant hybridization

Section 5	Mutagenesis in plant breeding.	5.1	A Brief History of Mutation Breeding. The Role of Spontaneous Mutations in Breeding.
		5.2	Physical and chemical mutagens.
		5.3	Detection of mutants in self- and cross-pollinated and vegetatively propagated crops. Achievements and problems of mutant selection.
Section 6	Polyploidy and haploidy in plant breeding.	6.1	Obtaining autopolyploids for breeding purposes using colchicine and other agents.
		6.2	Reduced seed productivity autopolyploids and methods of its increase
		6.3	Methods of obtaining haploids. Importance haploidy in distant hybridization. Advantages of haploid selection.
Section 7	Selection methods.	7.1	Main types of selection: Individual from homozygous populations in self-pollinators. Individual selection in cross-pollinators.
		7.2	Mass selection in self-pollinators and cross-linked. Selection from cell populations. Selection on selective media.
Section 8	Population genetics	8.1	Genetic processes in populations
		8.2	genetic foundations of evolution. Factors of population dynamics
Section 9	Organization and technique of the selection process	9.1	Creation of populations; plant selection; progeny testing.
		9.2	Types of selection crops. Types of variety testing.
		9.3	Typicality, accuracy of the experiment and the principle of a single difference in selection process.
		9.4	Field work techniques. Sowing, care, observations, evaluations, culling and crop accounting.
Section 10	Selection of heterotic hybrids	10.1	Brief history of selection for heterosis. Types of heterotic hybrids using corn as an example.
		10.2	Combination ability. CMS and its use in obtaining hybrid seeds.
Section 11	State testing and protection of selection achievements	11.1	Tasks and organization of state variety testing. Methodology and technique of its implementation.
		11.2	The procedure for including varieties in the state. Variety testing and zoning of varieties. Criteria for the protectability of selection achievements: novelty, distinctiveness, homogeneity, stability. Variety testing network and its work
Section 12	Seed production as branch of agricultural production. Objectives and goals of seed production.	12.1	Organization of seed production in modern conditions. The Law of the Russian Federation "On selection achievements" and the Law of the Russian Federation "On "seed production".
		12.2	Variety change and variety renewal as the most important tasks of seed production
		12.3	Requirements for sowing and planting material. Standards (GOSTs) for sowing seed quality. Documentation of varietal crops and seeds. Varietal control. Field testing and registration of crops. Peculiarities of testing of individual crops. Methodology and technology testing.

Course Title	Plant protection
Course Workload	5 credits (180 hours)
CONTENT OF THE DISCIPLINE	

Section number	Course Title section	Section (Topic) Contents	
Section 1	Phytopathogenic complex on various agricultural crops	1.1	Damage to agricultural crops by a complex of pests and diseases; symptoms of complex damage; sources of primary and secondary infection
Section 2	Basic methods of plant protection	2.1	Advantages and disadvantages of individual plant protection methods; combination of different protection methods; preventive and extermination events
Section 3	Agrotechnical method of plant protection	3.1	Advantages and disadvantages of agrotechnical method of protection; the role of crop rotation and soil cultivation in the regulation of phytosanitary conditions crops and plantings
Section 4	Physical and mechanical methods of plant protection	4.1	Advantages and disadvantages of physical and mechanical methods of protection; the use of various physical factors for disinfection of seed and planting material
Section 5	Quarantine	5.1	Quarantine as a method of plant protection; quarantine measures, quarantine diseases, pests and weeds; external and internal quarantine measures
Section 6	Biological method of plant protection	6.1	Advantages and disadvantages of the biological method of protection; the use of natural enemies of phytophages, parasitic and predatory vertebrates, antagonist fungi, hyperparasites
Section 7	Chemical method of plant protection	7.1	Advantages and disadvantages of chemical protection methods; main groups of chemicals drugs;
		7.2	Purpose, nature of action, dosage forms, methods of preparation and application working solutions, compatibility of drugs from different groups;
		7.3	Safety measures when dealing with chemical plant protection products

Course Title	Post-harvest processing
Course Workload	4 credits (144 hours)

CONTENT OF THE DISCIPLINE

Section number	Course Title section	Section (Topic) Contents	
Section 1	Basics of storage of plant products	1.1	Types of storage losses and factors causing them. Biosis, cenobiosis, abiosis, anabiosis and their varieties. Methods for reducing storage losses.
Section 2	Standardization of plant products.	2.1	Standards and normative-technical documents, their categories. Methods of determining the quality of plant products. Standardization of grain and leguminous crops. Commercial qualities, standardization and certification fruits, vegetables and potatoes.
		3.1	Storage of grain and seeds. Grain mass and its main components. Physical characteristics of grain mass. Biological properties of grain mass. Storage methods grain masses. Storage of vegetable seeds.

Section 3	Storage of grain and seeds.	3.2	Standards of natural loss during grain storage. Natural loss as an essential component of grain mass loss during post-harvest processing and storage. Calculation of the coefficient of loss of natural loss of seed grain. Development of standards for natural loss of grain and seeds during storage in different macroclimatic regions. Instructions for the application of standards for natural loss of grain, grain products and seeds during storage. Procedure calculation of natural loss of grain and seeds
Section 4	Basics of Bread Making	4.1	Nutritional value of bread. Methods of bread production. Baking properties of wheat and rye flour. Transportation and storage of bread. Diseases and defects of bread. Assortment of bakery products.
Section 5	Methods of preserving fruit and vegetable raw materials.	5.1	Biochemical and chemical changes in plant materials during canning. Storage of raw materials and their preparation for canning. Production technology certain types of canned goods. Labeling, accounting and storage of finished products.
Section 6	Raw material characteristics of grapes and basic requirements for their quality.	6.1	Microbiological and biochemical principles of winemaking. Basic technological schemes of grape processing. Classification and characteristics of different types of wine. Diseases, defects of wine materials and wines; their prevention and treatment. Technology production of non-alcoholic products from grape processing.
Section 7	Tea and basic requirements for its quality	7.1	Raw materials for tea production Chemical composition of tea. Collection of tea leaves. Tea factories and classification of tea. Tea production technology. Marking and storage of finished products.

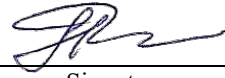
Course Title		Marketing	
Course Workload		3 credits (108 hours)	
CONTENT OF THE DISCIPLINE			
Section number	Course Title section	Section (Topic) Contents	
Section 1	Marketing	1.1	Introduction to Marketing
		1.2	Good and Goods
		1.3	Product policy
		1.4	Pricing policy
		1.5	Promotion of goods
Section 2	Enterprise Management	2.1	Introduction to Organization Management
		2.2	Principles and functions of management
		2.3	Organization
		2.4	Decision Making. Authority and Leadership
Course Title		Management	
Course Workload		3 credits (108 hours)	
CONTENT OF THE DISCIPLINE			
Section number	Course Title section	Section (Topic) Contents	
Section 1	Management	1.1	Introduction to Organization Management
		1.2	Principles and functions of management
		1.3	Organization
		1.4	Decision Making. Authority and Leadership
		2.1	Introduction to Marketing

Section 2	Sales of products	2.2	Good and Goods
		2.3	Product policy
		2.4	Pricing policy
		2.5	Promotion of goods

HEAD OF THE OP VO:

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Signature

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