

SHIVAJI UNIVERSITY, KOLHAPUR.



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CHOICE BASED CREDIT SYSTEM

Syllabus For

B.Sc. Part - II

Food Science and Technology (Entire)

(Sem. III & IV)

To be introduced From the academic Year 2021-22

(w. e. f. June 2021) onwards

Semester-III

Ù Cereals & legume Technology-I DSC-FST-C

Ù Cereals & legume Technology-I Credits-2(50 Marks)Hours 30,37.5lectures of 48 min

Unit		Hours Allotted
Unit-I-	<p>1½ Introduction to cereals & legumen -Structure wheat rice, ragi or sorgium -compstion of -Nutritive value -processing & storage -cooking quality.</p> <p>2½ milling of cereals- -Basic milling operations -Wheat milling- type of wheat, quality of blour & blour treatment, quality characteristics 7 rh eological properties & wheat, milling products & it's assessment by product utilization</p> <p>3½ rice milling- -milling of rice, types of rice mill, parboiling of paddy, crieteria in assessment of milling, cooking nutritional & storage quality of raw & parboiled rice, processed rice product (flaked, expanded, puffed) by product utilization.</p>	15

Unit- II	<p>1)Ragi Processing- types of ragi, milling of ragi, quality of blour & blour treatment. Quality characteristics & rheological properties of ragi, milling products- malt & it's assessment, by product utilization.</p> <p>2) Sorghum processing- -types of sorghum, milling of sorghum, quality of blour & blour treatment, Quality characteristics & rheological properties of sorghum, milling products & it's assessment by product utilization</p> <p>3)Pulses processing- - Structure & composition -processing of Turd hal, moong dal, masoor dal, chick pea & urad dal, toxic cercsituteuts in pulses, soaking, germination, decortications, cooking & femeutation. -milling of pulses-dry milling, wet milling, improved milling method.</p>	15
Reference book- previous old syallabus		

Ô Cereal & legume Technology- II DSC-FST- C2

Ô Cereal & legume Technology- II Credits-2(50 Marks)Hours 30,37.5lectures of 48 min

Unit		Hours
Unit-I	<p>1)processing of corn.</p> <ul style="list-style-type: none">- Structure & composition of corn grain,-types of corn- wet & dry milling of corn & their products- corn sweetness & their uses <p>2) processing of barely</p> <ul style="list-style-type: none">- Structure & composition of barely.- Barely malting proess.- significance of malting.-Different types of malts & their Food applications	15

Unit- II	<p>1)Processing of legumes & pulses</p> <ul style="list-style-type: none"> - soaling, roasting, steaming & Cooking -germination, parching -factors affecting cooking of legumes - processing of fried pulses. - end products of legumes & pulses, - processed soybean products- soya oil, meal flour, infant formula, - pulse protein concentrates- extracted soya bean proteins, soyabean card, soyabean milk. -fermented products of soyabean- soya sauce, soyabean parte (miso), Temph, Natto, Humantto. <p>2)utilization of pulses-</p> <ul style="list-style-type: none"> -mature seeds -fresh seeds -immature seeds 	15
Reference book- refer old syllabus for reference book		

Û Post harvest technology-I DSC-FST-C3

Û Post harvest technology-I Credits-2(50 Marks)Hours 30,37.5lectures of 48 min

Unit		Hours
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Unit- I	<p>1)Plantation on crops -introduction to post harvest techonolgy. -importance of plantation crops.</p> <p>2) Tea -occurance, History. -Chemicals constitaueuls, -harvesting -leaf processing -types & varieties -manufacturing of green & black tea - quality & grading of tea -packaging</p> <p>3)coffee- -History, Occurance - Chemical constitaueuls, -harvesting, - bean processing -types & varieties -manufacturing of coffee -fermentation & cluanger during fermentation -quality & grading -adultrants used in coffee -instant coffee</p>	15
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Unit- II	<p>1)coca-</p> <ul style="list-style-type: none"> -Intoduction -compostion -grading -production -processing -cocca products(coca mass, cocca powder, cocca butter, cocca based beverages, cocca liquid malted beverages. <p>2)Chocolate-</p> <ul style="list-style-type: none"> -introduction -ingridiuts - types -chocolate processing -mixing - pefining -conching -tempering -cooling & coating -Defects in chocolate <p>3)Coconut processing-</p> <ul style="list-style-type: none"> -production -compostion -grading, -post harvest technology, -processing & products (coconut milk, desiccated cocont) <p>4cashew nut harvesting & processing</p>	15
Reference book- old syallabus		

Û Post harvest Techonology- II- DSC-FST-C4

Post harvest Techonology- II Credits-2(50 Marks)Hours 30,37.5lectures of 48 min

Unit		Hours
Unit-I	1)post harvest technology of spices - History of spices & condiments -classification & composition of spices & condiments -fumigation of irradiation of spices 2) major spices- chemisty, constitalent, nutritive value & functional benefits of the following -pepper (black, white & green) -cardamom -cloves -ginger - chillied (red & green) -Turmeric -processed products -oleoresins & volatile oils	15

Unit- II	<p>1)Minor spices-</p> <ul style="list-style-type: none"> -cumin -coriander -feenugreele -safforn -tamrind -cinnamon -ajwan -mustard -mace -garlic -onion -mint -asafoetida -nutmeg -constitutents -nutritive value -functional benefit -processed products -oleo resins & volatile oils. <p>2) Raw & refined sugar-</p> <ul style="list-style-type: none"> -introduction -manufacturing of raw & refined sugar <p>3)other plantation crops-</p> <ul style="list-style-type: none"> -vanilla -annatto -their processing -Quality control 	15
Reference book- refer old syallabus		

Unit		Hours
Unit- I	1)Introduction of bakery Products- - Introduction -importance of bakery -principle used in bakery products -working application of dough mixes -moulding machine -oven machine -equipment for batch & continous processing of bakery products 2)baleing -esseutial & optional ingridieuts -role of each ingridieuts -types & quality of flou -various dough & their uses -process parameter -heat transfer in baleing, fime, femp relationship in baleing	15
Unit-II	1)Introdution to confectinary -Unit overview & description -Introduction to confectinary -scope of confectinary -confectinary terms -small &large equipment used in confectinary 2)Introduction of confectinary products -principles involved in confectinary products -classification of confectinary -types of confectinary products -characteristics of confectinary products -Indian confectinary	15
Reference book- refer old syllabus		

Bakery & Confectionary Technology-II DSC-FST-C6

Bakery & Confectionary Technology-II Credits-2(50 Marks)Hours 30,37.5lectures of 48 min

Unit		Hours
Unit-I	<p>1)Processing of bakery products.</p> <ul style="list-style-type: none"> -calee :- types, formulation & process, principle of calee, characters of calee Bread :- formulation, process, principle of bread, preparation , baking, defects Biscuits & cookies :- Defⁿ, difference between biscuits & cookies, types of cookies & biscuits, cracleer & geuezal defects <p>2)preservation of bakery products-</p> <ul style="list-style-type: none"> -preservation of baked product, -freezing & frozen storage of baked product -equipment for frozen storage, canned bakery product. -quality aspect of preserved baked products -maintanince. -safety & hygiene of bakery plant. 	15
Unit-II	<p>1)chocolate processing</p> <ul style="list-style-type: none"> -ingridieuts used in chocolate -cocca butter substitutes -processing of coca beans -chocolate refining -conching & molding, -eurobing -panning <p>2)sugar confectiony</p> <ul style="list-style-type: none"> -types of sugar -prodⁿ, storage -alternative bulle sweetness -corn syrup & glucoe syrup -artifical sweetness -chewing gum & bubble gum <p>3) Boiled & Gelatin Sweets-</p> <ul style="list-style-type: none"> -Hard & soft boiled sugar confectionary- fondant, fudge, caramel, toffee, nut brittles -gelatin sweets- fruit chews, jellies, gums, - defects in confe ctionary- sagnar bloom, fat bloom 	15

Semester IV

Processing of Fruits & vegetables-I DSC-FST –D1

Processing of Fruits & vegetables-I Credits-2(50 Marks)Hours 30,37.5lectures of 48 min

Unit		Hours
Unit- I	1)introduction of fruits -classification & composition of fruits & -climacteric & Non Climacteric fruits -post harvest handling -precooling methods -post harvest treatments -storage of fresh fruits- ambient, refrigerated, modified atomosphere -evaporative cool storage 2)Introduction to vegetables -morphology of vegetables -classification of vege -comosition of vege -nutritive value of vege -biochemical changes in vege 3) Techaiques of fruits & vege. processing -current scenario of fruit & veget in india - world scope of fruit & veg. processing industry in india- -present stantus, constraints & prospective -canning of fruits & vege- principle & process -packaging materials used for canning -causes of spoilage of spoiled canned foods	15

Unit-II	<p>1)Drying / dehydration of fruits & vege</p> <ul style="list-style-type: none"> -sundrying -factors affecting rate of drying -principle & prefreat meuts for drying -process of drying -types of driers -spoilage of dried products -reconstitution test for dried products. <p>2)freezing rocess of fruits & veg</p> <ul style="list-style-type: none"> -types of freezing -changes during freezing -changes during storage <p>3) chemical preservation-</p> <ul style="list-style-type: none"> -different types of chemicals used in fruits & veg. processing -preservation by sulphar dioxide & sodium benzoate -safe limits of usage 	15
Reference book - refer old syallabus		

Processing of Fruits & vegetables-II DSC-FST-D2

Processing of Fruits & vegetables-II Credits-2(50 Marks)Hours 30,37.5lectures of 48 min

Unit		Hours
Unit-I	<p>1)Fruit Processing-</p> <ul style="list-style-type: none"> -Jam- Introduction constituent , selection of fruit processing & tech. Tests for end point determination problems in jam making, pectin properties -jellies- difference betn jam & jelly, processing of jelly, end point determination, failure of jellies to set, cloudy or foggy jellies, formation of crystals synesis -marmalade- types, jam marmalade, jelly marmalade, problem in marmalade making -preserve & candy -chased & crystallized fruits <p>2)fruit beverage-</p> <ul style="list-style-type: none"> -introduction -processing of fruits, juice, preservation of fruit juice, -pasteurization -chemically preserved with sugar -freezing -drying -tetra paking carbonation -processing of RTS -processing of squarhes -processing of cordials -processing of nector, concen & powder 	15
Unit-II	<p>1)vegetable processing</p> <ul style="list-style-type: none"> -pickles- manufactureing, types, defects, problem in pickle making, spoilage in pickles, -saurkral –principle, process, defects & spoilagein saurlerat -chutney-preparation -sauces & ketchups- difference bten sauce & ketchup classification of sauces- thick & thin, processing of tomato sauce/ketchup. 	15

	-prepn of soya sauce- problems in making sauces	
	2)value added products from processing -mushroom processing -drying/dehydration of mushroom -pickling of mushroom -processing of aamchur -processing of mango leather -processing of fruit cheese -processing of fruit butter -processing of toffee -processing of papain	
Reference book - refer old syllabus		

Oil seed & nuts Technology –I DSC-FST-D3

Oil seed & nuts Technology-I Credits-2(50 Marks)Hours 30,37.5lectures of 48 min

Unit		Hours
Unit-I	<p>1)Oilseeds</p> <ul style="list-style-type: none"> -Structure, composition, nutritive value, toxic constituents & market varieties of oilseeds -post harvest technology- storage, transportation, handling, prevention of spoilage & post-harvest losses mitigation -processing methods & manufacture of oil & facts -products of processing -effect of processing on composition & nutritive -fortification & value addition of products <p>2)Nuts</p> <ul style="list-style-type: none"> -Structure Composition -nutritive value -toxic constituents -health benefits -storage transportation handling 	15
Unit-II	<p>1)Extraction of oil</p> <ul style="list-style-type: none"> -mechanical expelling -solvent extraction -deoiled cake -future development in products & processes -processing of groundnut- -processing of soybean -processing of sunflower -processing of gingelly seed -processing of coconut -processing of mustard -processing of olive oil -processing of cottonseed -processing of ricebran 	15

	-processing of maize germ	
Reference book - refer old syllabus		

Oil Seed & Nuts Technology-II DSC-FST-D4

Oil seed & nuts Technology-II Credits-2(50 Marks)Hours 30,37.5lectures of 48 min

Unit		Hours
Unit-I	1)refining oil -Classification -degumming -neutralization (alkali refining) -bleaching -deodorization techniques or processes -blending oil -processing of refined oils -hydrogenation -fractionation -winterization -inter – esterification 2)factors affecting extraction 3)packing and storage of fats and oil -changes during storage	15
Unit- II	Processing of fats -Margarine -Mayonnaise -salad dressing -fat substitution -lard -tallow -cocoa -butter equivalent -peanut butter - low fat spread peanut butter -speciality fats and designed lipid for nutrition and dietetics - nutritional food mixer from oilseeds.	15

Reference – Refer old syllabus.

Food Packaging I DSC –FST-D5

Food Packaging I Credits-2(50 Marks)Hours 30,37.5lectures of 48 min

<p>Unit-I</p>	<p>1.Introduction -History -Importance of functions and food packaging -Properties of packaging material. -package design. -Test for flexible packaging materials. -materials used in packaging –rigid,semi-rigid and flexible. -Type of containers. 2. Wood and paper packaging. -Wood -Structure -wooden containers -types -type of wooden box -properties -paper and paper board. -structure - CFB Boxes -properties -comparison with wooden containes. -types -uses of paper and paper board.</p>	<p>Hours</p> <p>15</p>
<p>Unit 2</p>	<p>1.Plastic Packaging. -plastic packaging materials. -Plastic banned in india. -classification of polymens. -functional and mechanical properties of thermoplastic polymens. -processing and converting of thermoplastic polymers. -testing and plastic packages. 2.Techniques and method used for packaging. - Techniques and method used for packaging of cereal and cereal products. - Techniques and method used for packaging fruits and vegetables. - Techniques and method used for packagingmilk and milk productes. - Techniques and method used for packaging meats and meats products. - Techniques and method used for packagingto everges -sheif life evalution of packed products.</p>	<p>15</p>

Food packaging II DSC-FST-D6

Food Packaging II Credits-2(50 Marks)Hours 30,37.5lectures of 48 min

Unit-I	1.Glass & metal Pakaging.	Hours
	<p>a.Glass .</p> <ul style="list-style-type: none"> -Composition. -Properties. -Stucture. -Types. -Manufacture of glass Containers uses .breakagein glass clousure for glass containers. <p>b.Metals.</p> <ul style="list-style-type: none"> -propertien of metals. -Different methods used in food packaging -steel plate & functions of steel. -Formation of two piece & three piece cans. -Aluminium foil -Corrosion of metal cans. <p>2.Packaging Methods</p> <ul style="list-style-type: none"> -Aseptic packaging of foods-Sterilization of packaging material,food contact surfaces &aspetic packaging systems. -Active food packaging –detn,scope,physical &chemical principles involved. -Edible films &coatings. 	15
Unit-II	<p>1.Oxygen absor bents</p> <ul style="list-style-type: none"> -classification &main types of oxygen absorbents. -factors influencing the choice of oxygen absorbents -Application of oxygen absorbents for shelf –life of food. -Advantages & disadvantages of oxygen absorbents. <p>2. Safety Considerations in food packaging.</p> <ul style="list-style-type: none"> -Labelling. -Types of food safety associated withpackaging. 	15

	<ul style="list-style-type: none">-Package labeling & food safety.-Food packaging & environment- recycling,composting,thermal treatment & land fill.	
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Reference – Refer old syllabus