

# **Faculty of Applied Sciences**

## **SKILL SETS**

# Programme: B.Sc. (Hons) Biotechnology

Co-op Level	Student Capabilities	Student Limitations	Expectations/Requirements of Co-op Job
Level 1	Basic Sciences : Biology, Mathematics, Chemistry I & II	Microbiological techniques	Exposure to Biotech laboratory or industrial environment
	Human Physiological Sciences I	Molecular Cell Biology	Some hands on exposure to biotechnological techniques
	Structural Biochemistry	Metabolic Biochemistry	Opportunity to be part of a team to carry out an R&D or production project, under guidance and supervision.
	Basic Computer Programming	Pharmacology	Opportunity to be part of a team to carry out an R&D or production project, under guidance and supervision.
		<b>What student can do:</b>	<b>What student cannot do:</b>
		Microscopy	Microbiological technique
		Dissection of small mammals, amphibians	Molecular cell biology technique
		Basic and applied calculus & analytical geometry	
		Volumetric experiments	
		Molar concentrations of solutions	
		Chemical equilibrium & kinetics	
	Reduction –oxidation reactions and applications		

# Programme: B.Sc. (Hons) Biotechnology

Co-op Level	Student Capabilities	Student Limitations	Expectations/Requirements of Co-op Job
Level 2	Metabolic biochemistry	Enzyme technology	Exposure to some of the following areas in laboratory or industrial environment:
	Safety issues of laboratory	Fermentation technology & downstream processing	i) Microbiological technique
	Exposure to basic laboratory equipments	Bioprocess engineering	ii) Basic molecular cell technique
	Preparation of solutions	Cell & tissue culture	iii) Preparation of chemical solutions
	Microbiological technique		iv) Metabolic biochemistry
	Molecular cell biology		v) Other Biotechnological procedures and techniques or products
	Sewage & waste water treatment		
	Microbial biotechnology		

# Programme: B.Sc. (Hons) Biotechnology

Co-op Level	What student can do:	What student cannot do:
Level 2	Microbiological technique	Technique for enzymatic studies
	Application of standard basic lab equipments (pH meter, balances etc)	Fermentation studies
	Fermentation process of microorganisms	Cell & Tissue Culture Cloning
	Transformation of Bacterial cells	
	Preparation & purification of DNA and cloning	

# Programme: B.Sc. (Hons) Biotechnology

Co-op Level	Student Capabilities	Student Limitations	Expectations/Requirements of Co-op Job
Level 3	Enzyme Technology	Nil	Exposure to biotechnology industry in one of the following areas:
	Fermentation Technology		Fermentation technology & downstream processing
	Downstream Processing		Pharmaceutical biotechnology industry
	Bioprocess Engineering		Bioprocess engineering
	Industrial & Environmental Biotechnology		Cell & tissue culture cloning industry
	Cell & Tissue Culture		Food Biotech industry
		<b>What student can do:</b>	<b>What student cannot do:</b>
		Cell & tissue culture cloning	Nil
		Kinetic studies with fermentor / bioreactor	
		Extraction & determination of enzyme activity	
	Adsorption chromatography, sonication & electrophoresis.		

# Programme: B.Sc. (Hons) Food Science & Nutrition

Co-op Level	Student Capabilities	Student Limitations	Expectations/Requirements of Co-op Job
Level 1	Biochemistry	Microbiological Analysis	Opportunities to be exposed to the following area in the food industry / laboratory:
	Programming	Food Analysis	Quality assurance
	Quality Management	Basic Nutrition	Sensory evaluation
	Basic Science		Biochemical analysis
			Basic sciences
			Basic computer programming
		<b>What student can do:</b>	<b>What student cannot do:</b>
		Quality Assurance	Microbiological Analysis
		Biochemistry	Food Analysis
			Advisory & Consultancy

# Programme: B.Sc. (Hons) Food Science & Nutrition

Co-op Level	Student Capabilities	Student Limitations	Expectations/Requirements of Co-op Job
Level 2	Microbiology	Food Technology	Opportunities to carry out one or more of the following :
	Food Chemistry	Food Engineering	Microbial analysis
	Nutrition	Nutrition & Human Diseases	Food processing
	Analytical Chemistry		Nutrition evaluation
	Food Processing & Preservation		Food chemical analysis
			Food packaging
			Dietary advisory & consultancy
		<b>What student can do:</b>	<b>What student cannot do:</b>
		Microbial analysis	Food engineering
		Food processing	
		Nutrition evaluation	
	Food chemical analysis		
	Packaging methods		

# Programme: B.Sc. (Hons) Food Science & Nutrition

Co-op Level	Student Capabilities	Student Limitations	Expectations/Requirements of Co-op Job
Level 3	Food engineering	Nil	Opportunities to carry out one or more of the following :
	Food technology		F & D projects in food testing or new product development
			Food technology aspect of food manufacturing / production industry
			Food engineering aspect of food manufacturing plants
			Other food science or nutrition related industry or processes
		<b>What student can do:</b>	<b>What student cannot do:</b>
		Almost all the food sciences covered	Nil