



# WALJAT COLLEGE OF APPLIED SCIENCES

In Academic Partnership With

**BIRLA INSTITUTE OF TECHNOLOGY**



## DEPARTMENT OF BIOTECHNOLOGY AND CHEMICAL ENGINEERING

**Programme:** Bachelor of Engineering in Biotechnology

**Duration:** 4 Years

### PROGRAMME Structure

#### Semester – I

Programme No.	Programme Title	L	T	P	Credits
HU 1101	Technical English	3	0	0	3
PH 1201	Physics	3	1	0	4
MA 1201	Engineering Mathematics	3	1	0	4
EE 2201	Principles of Electrical Engineering	3	1	0	4
CH 1401	Engineering Chemistry	3	0	0	3
ME 1202	Engineering Graphics	1	0	3	3
CS 1302	Fundamental of Unix & C Programming	1	0	3	3
PE 1202	Workshop Practice	0	0	3	2
PH 1202	Physics lab	0	0	3	2
GA 1002/ GA 1004/ GA 1006/ GA 1008	NCC / NSS / PT & Games / Creative Arts	0	0	2	1
<b>Total</b>					<b>29</b>

#### Semester – II

Programme No.	Programme Title	L	T	P	Credits
EC 2001	Principle of Electronics Engineering	3	0	0	3
MA 2201	Advance Engineering Mathematics	3	1	0	4
CH 2203	Environmental Science	3	0	0	3
CS 2301	Fundamentals of Data Structure	3	1	0	4
ME 2001	Principles of Mechanical Engineering	3	0	0	3
AM 1201	Engineering Mechanics	3	1	0	4
CH 1402	Chemistry Lab	0	0	3	2
EE 3202 / AM 2202	Basic Electrical Engineering Lab / Engineering Mechanics Lab	0	0	3	2
EC 2002	Basic Electronics Engineering Lab	0	0	3	2
CS 2302	Data Structure Lab	0	0	3	2
GA 2002/ GA 2004/ GA 2006/	NCC / NSS / PT & Games / Creative Arts	0	0	2	1

GA 2008					
				<b>Total</b>	<b>30</b>

### Semester – III

<b>Programme No.</b>	<b>Programme Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
BT3023	Cell & Molecular Biology	3	0	0	3
BT3025	Bio-analytical techniques	3	0	0	3
BT3027	Biomolecules & Bioenergetics	3	0	0	3
BT3029	Chemical Engineering I	3	0	0	3
BT3001/ HU4001	Biological Science / Foreign Language <b>(Breadth Subject III)</b>	3	0	0	3
AM2202/ EE3202	Engineering Mechanics Lab/ Basic Electrical Engg Lab	0	0	2	2
BT3024	Cell & Molecular Biology Lab.	0	0	2	2
BT3026	Bio-analytical techniques Lab.	0	0	2	2
BT3028	Biochemistry Lab.	0	0	2	2
GA 3002/ GA 3004/ GA 3006/ GA 3008	NCC / NSS / PT & Games / C. Arts	0	0	2	1
				<b>Total</b>	<b>24</b>

### Semester – IV

<b>Programme No.</b>	<b>Programme Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
BT 4021	Chemical Engineering II	3	1	0	4
BT 4023	Microbiology	3	0	0	3
BT 4025	Immunology	3	0	0	3
BT 4027	Thermodynamics of Chemical & Biological Systems	3	0	0	3
HU 4001/ BT 3001	Foreign Language / Biological Science <b>(Breadth Subject IV)</b>	3	0	0	3
BT4022	Chemical Engineering I Lab	0	0	2	2
BT4024	Microbiology Lab	0	0	2	2
BT4026	Immunology Lab	0	0	2	2
GA 4002/ GA 4004/ GA 4006/ GA 4008	NCC / NSS / PT & Games / Creative Arts	0	0	2	1
				<b>Total</b>	<b>23</b>

**Semester – V**

<b>Programme No.</b>	<b>Programme Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
BT5021	Bioprocess Engineering	3	0	0	3
BT5023	Chemical Engineering III	3	1	0	4
BT5025	Functional Genomics and rDNA Technology	3	0	0	3
BT5027	Reaction Engineering	3	0	0	3
	<b>Breadth Subject-V</b>	3	0	0	3
BT5022	Bioprocess Engineering Lab.	0	0	2	2
BT5024	Chemical Engineering Lab. II	0	0	2	2
BT5026	rDNA Tech. Lab	0	0	2	2
				<b>Total</b>	<b>22</b>

**Semester – VI**

<b>Programme No.</b>	<b>Programme Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
BT6021	Bioseparation Engineering	3	0	0	3
BT6023	Plant & Agriculture Biotechnology	3	0	0	3
BT6025	Food & Enzyme Technology	3	0	0	3
BT6027	Process Measurement and Control	3	0	0	3
	<b>Breadth Subject-VI</b>	3	0	0	3
BT6022	Bioseparation Engineering Lab.	0	0	2	2
BT6024	Plant Cell Technology Lab.	0	0	2	2
BT6026	Enzyme Technology Lab.	0	0	2	2
				<b>Total</b>	<b>21</b>

### Semester – VII

Programme No.	Programme Title	L	T	P	Credits
BT7021	Biological Waste Management	3	0	0	3
BT7023	Bioreactor and Bioprocess Design	3	0	0	3
	<b>Breadth Subject-VII</b>	3	0	0	3
	ELECTIVE I	3	0	0	3
	ELECTIVE II	3	0	0	3
BT7022	Environmental Biotechnology Lab.		0	2	2
BT7024	Bioinformatics Lab I		0	2	2
BT7050	Dept. Project I		0	8	4
				<b>Total</b>	<b>23</b>

### Semester – VIII

Programme No.	Programme Title	L	T	P	Credits
BT8021	Biotechnology Management	3	0	0	3
BT8040	Industrial Training (To be evaluated with Dept. Project II)	-	-	-	-
BT8050	Dept. Project II	0	0	8	4
				<b>Total</b>	<b>7</b>

### Breadth – V (Elective)

Programme	Programme Title	Credits
MSH 1131	Principles of Management	3
PE 5021	Industrial Organization and Management for Oman	3
MSH 1125	Organization Behavior	3
MSH 1113	Environmental Psychology	3
PE 5011	Project Engineering	3

### Breadth – VI (Elective)

Programme	Programme Title	Credits
MSH 1137	Economics	3
PE 6009	Engineering Economy	3
MSH1117	Financial Management	3

**Breadth – VII (Elective)**

<b>Programme</b>	<b>Programme Title</b>	<b>Credits</b>
MSH 1159	IPR in Oman	3
MSH 1163	Entrepreneurship and Small Business Management in Oman	3
MSH 1161	Business Ethics in Oman	3

## Department Electives

Programme No.	Programme Title	Credits
BT7025	Bioenergy	3
BT7027	Bioremediation	3
BT7029	Pharmaceutical Biotechnology	3
BT7031	Mineral Biotechnology	3
BT7033	Animal & Stem Cell Technology	3
BT7035	IPR, Biosafety & Bioethics	3
BT 7012	Agriculture Biotechnology	3
BT 7013	Bioresources & Biodiversity	3
MMI 1101	Human Anatomy & Physiology for	3
MMI 3103	Introduction to Clinical	3
BT 7015	Biomaterials	3
BT 7017	Nano Biotechnology	3
MMI 3101	Biomedical Imaging Devices &	3
BT 8011	Marine Biotechnology & Aquaculture	3
BT 8012	Pharmaceutical Biotechnology	3
BT 8013	Biotechnology Management	3
MMI 2107	Fiber Optics & LASER in Medicine	3
BT 8015	Legal & Social Issues in	3
BT 8017	Bioremediation	3
BT 8018	Animal & Stem Cell Technology	3

Semester	Credits
1	29
2	30
3	24
4	23
5	22
6	21
7	23
8	07
<b>Grand Total</b>	<b>179</b>

**Note:** Bachelor of Engineering in Biotechnology Degree shall be awarded on successfully earning of 179 credits by the end of fourth year studies.