



**UTTARANCHAL UNIVERSITY**  
Uttarakhand College of Applied & Life Sciences  
Department of Biotechnology

# **Scheme of Examination**

## **&**

# **Detailed Syllabus**

**For**

**B.Sc. (Hons) Microbiology**  
**(3 year Programme)**

**Under Choice Based Credit System**  
**(With effect from 2019-2020)**

**Department of Biotechnology**  
**Uttarakhand College of Applied & Life Sciences (UCALS)**  
**Uttarakhand University, Dehradun**

**B.Sc. (Hons) Microbiology (3years course)**  
(As per new guidelines of UGC)



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**Evaluation Scheme**

Semester – I									
S. No.	Code	Paper Title	L-T-P	Credit	Theory		Practical		Total
					End sem.	Sess.	End sem.	Sess.	
1.	TBMC 101	Biochemistry & Metabolism	4-0-0	4	60	40	-	-	100
2.	TBMC 102	Cell Biology	4-0-0	4	60	40	-	-	100
3.	TBMC 103	Generic Elective-1 (GE-1)	3-0-0	3	60	40	-	-	100
4.	TBMC 104	Introduction to Microbiology and Microbial Diversity	4-0-0	4	60	40	-	-	100
5.	*RMB 105 *RMM 105	*Remedial Biology *Remedial Math	2-0-0	0	-	50	-	-	-
6.	PBMC 101	Biochemistry & Metabolism	0-0-4	2	-	-	25	25	50
7.	PBMC 102	Cell Biology	0-0-2	1	-	-	25	25	50
8.	PBMC 103	Generic Elective-1 (GE-1)	0-0-2	1	-	-	25	25	50
9.	PBMC 104	Introduction to Microbiology and Microbial Diversity	0-0-4	2	-	-	25	25	50
10.	ADP 106	Academic activity	0-0-2	1				50	50
		<b>Total</b>	<b>17-0-14</b>	<b>22</b>					<b>650</b>

\*This a non credit course but minimum qualifying marks 40% i.e. 20 out of 50 is required.



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<b>Semester – II</b>									
S.No.	Code	Paper Title	L-T-P	Credit	Theory		Practical		Total
					End sem.	Sess.	End sem.	Sess.	
<b>1</b>	<b>TBMC 201</b>	Bacteriology	4-0-0	4	60	40	-	-	100
<b>2</b>	<b>TBMC 202</b>	Virology	4-0-0	4	60	40	-	-	100
<b>3</b>	<b>TBMC 203</b>	Generic Elective-2 (GE-2)	4-0-0	4	60	40	-	-	100
<b>4</b>	<b>TBEC204</b>	English Communication (AE-2)	2-0-0	2	60	40	-	-	100
<b>5</b>	<b>TBMC 205</b>	Discipline Specific Elective – 1 (DSE-1)	4-1-0	5	60	40	-	-	100
<b>6</b>	<b>TBES- 206</b>	Environmental Sciences *	2-0-0	2	60	40	-	-	100
<b>7</b>	<b>PBMC 201</b>	Bacteriology	0-0-4	2	-	-	25	25	50
<b>8</b>	<b>PBMC 202</b>	Virology	0-0-4	2	-	-	25	25	50
<b>9</b>	<b>PBMC 203</b>	Generic Elective-2 (GE-2)	0-0-2	1	-	-	25	25	50
		<b>Total</b>	<b>20-1-10</b>	<b>26</b>					<b>750</b>



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**Semester – III**

S.No.	Code	Paper Title	L-T-P	Credit	Theory		Practical		Total
					End sem.	Sess.	End sem.	Sess.	
1	TBMC 301	Microbial Genetics	4-0-0	4	60	40	-	-	100
2	TBMC 302	Microbial Physiology and Metabolism	4-0-0	4	60	40	-	-	100
3	TBMC 303	Chemistry -1	4-0-0	4	60	40	-	-	100
4	TBMC 304	Generic Elective-3 (GE-3)	3-0-0	3	60	40	-	-	100
5	TBMC 305	Skill Enhancement Course (SEC-1)	3-0-0	3	60	40	-	-	100
6	PBMC 301	Microbial Genetics	0-0-4	2	-	-	25	25	50
7	PBMC 302	Microbial Physiology and Metabolism	0-0-4	2	-	-	25	25	50
8	PBMC 303	Chemistry -1	0-0-2	1	-	-	25	25	50
9	PBMC 304	Generic Elective-3 (GE-3)	0-0-2	1	-	-	-	25	25
10	PBMC 305	Skill Enhancement Course (SEC-1)	0-0-2	1	-	-	-	25	25
11	ADP 306	Seminar Presentation	0-0-2	1	-	-	25	25	50
		<b>Total</b>	<b>18-0-16</b>	<b>26</b>					<b>750</b>



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**Semester – IV**

S.No.	Code	Paper Title	L-T-P	Credit	Theory		Practical		Total
					End sem.	Sess.	End sem.	Sess.	
1	TBMC 401	Molecular biology	4-0-0	4	60	40	-	-	100
2	TBMC 402	Immunology	4-0-0	4	60	40	-	-	100
3	TBMC 403	Chemistry-II	4-0-0	4	60	40	-	-	100
4	TBMC 404	Generic Elective-4 (GE-4)	3-0-0	3	60	40	-	-	100
5	TBMC 405	Skill Enhancement Course – 2 ( SEC-2)	3-0-0	3	60	40	-	-	100
6	PBMC 401	Molecular biology	0-0-4	2	-	-	25	25	50
7	PBMC 402	Immunology	0-0-4	2	-	-	25	25	50
8	PBMC 403	Chemistry-II	0-0-2	1	-	-	25	25	50
9	PBMC 404	Generic Elective-4 (GE-4)	0-0-2	1	-	-	-	25	25
10	PBMC 405	Skill Enhancement Course – 2 ( SEC-2)	0-0-2	1	-	-	-	25	25
11	*ADP 406	*Personality Development Programme	2-0-0	0	-	50	-	-	-
		<b>Total</b>	<b>20-0-14</b>	<b>25</b>					<b>700</b>

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Semester – V									
S.No.	Code	Paper Title	L-T-P	Credit	Theory		Practical		Total
					End sem.	Sess.	End sem.	Sess.	
1	TBMC 501	Environmental Microbiology	4-0-0	4	60	40	-	-	100
2	TBMC 502	Recombinant DNA technology	4-0-0	4	60	40	-	-	100
3	TBMC 503	Discipline Specific Elective – 2( DSE-2)	4-0-0	4	60	40	-	-	100
4	TBMC 504	Medical Microbiology	4-0-0	4	60	40	-	-	100
5	PBMC 501	Environmental Microbiology	0-0-4	2	-	-	25	25	50
6	PBMC 502	Recombinant DNA technology	0-0-4	2	-	-	25	25	50
7	PBMC 503	Discipline Specific Elective – 2( DSE-2)	0-0-2	1	-	-	25	25	50
8	PBMC 504	Medical Microbiology	0-0-2	1	-	-	25	25	50
9	ADP 505	Reasoning Skills	2-0-0	1	-	50	-	-	50
		<b>Total</b>	<b>18-0-12</b>	<b>23</b>					<b>650</b>



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**Semester – VI**

S.No	Code	Paper Title	L-T-P	Credit	Theory		Practical		Total
					End sem.	Sess.	End sem.	Sess.	
1	<b>TBMC 601</b>	Food and Dairy Microbiology	4-0-0	4	60	40	-	-	100
2	<b>TBMC 602</b>	Industrial Microbiology	4-0-0	4	60	40	-	-	100
3	<b>TBMC603</b>	Discipline Specific Elective – 3	4-0-0	4	60	40	-	-	100
4	<b>PBMC 601</b>	Food and Dairy Microbiology	0-0-4	2	-	-	25	25	50
5	<b>PBMC602</b>	Industrial Microbiology	0-0-4	2	-	-	25	25	50
6	<b>PBMC603</b>	Discipline Specific Elective – 3	0-0-2	1	-	-	25	25	50
7	<b>PBMC604</b>	Discipline Specific Elective – 4	0-0-10	5	-	-	150	50	200
		<b>Total</b>	<b>12-0-20</b>	<b>22</b>	-	-	-	-	<b>650</b>
		<b>Grand Total (I to VI Sem)</b>		<b>144</b>					<b>4150</b>



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**Generic Electives: (any one per semester in semesters 1-4)-GE 1 to GE 4**

- General Biotechnology (TBMC/PBMC-103)
- Computer Application (TBMC/PBMC -203)
- Enzymology (TBMC/PBMC -304)
- Entrepreneurship Development (TBMC/PBMC -404)

**Skill Enhancement Courses: (any one per semester in semesters 3-4) – SEC 1 to SEC 2**

**SEC 1 (TBMC-305 (I))**

- Microbial Quality Control in Food and Pharmaceutical Industries (01)
- Biofertilizers and Biopesticides (02)
- Microbiological Analysis of Air and Water

**SEC 2 (TBMC-405 (I))**

- Microbial Diagnosis in Health Clinics (01)
- Management of Human Microbial Diseases (03)
- Management of Human Microbial Diseases

**Discipline Specific Electives: DSE 1 to DSE4**

**DSE 1**

- Biomathematics and Biostatistics
- Biosafety and Intellectual Property Rights

**DSE 2**

- Bioinformatics
- Microbial Biotechnology
- Advances in Microbiology

**DSE 3**

- Instrumentation and Bio techniques
- Plant Pathology
- Inheritance Biology Plant.

**DSE 4**

- Project Work
- Microbes in Sustainable Agriculture and Development