

### **Programme Objective:**

To understand and apply basic concepts in Microbiology through interdisciplinary subjects which will create foreground for higher studies in future. By implementing state-of-the-art technology, inoculation of research aptitude in students is one of the objectives. This course is formulated to enforce knowledge through updated curriculum in accordance to national/international competitive examinations. Students will learn professional ethics, problem solving attitude and innovative thinking for the welfare of society and human beings.

### **Programme Outcome:**

To set forth an ability to apply microbiological skills and its applications in core and allied fields. Students will be provided with the concepts and research approaches and ethics for their higher career in the field of biology and develop their scientific interest. An in-depth practical oriented knowledge to students in various thrust areas of microbiology, so as to meet the demands of industry and academia.

### **Minimum eligibility criteria:**

Candidates should have passed the 10+2 examination from a recognized Central or State Board or its equivalent in science stream with a minimum of 50% marks, with Biology as compulsory subject in addition to any two subjects from Physics / Chemistry / Statistics / Computer Science

### **Process of admission:**

Based on the performance of JIS University online entrance test along with % of marks and the guidelines prescribed by the University.

# JIS University

## Curriculum for B.Sc. in Microbiology

Credit Distribution across the Course				
Course Type	Total Papers	Credit		Total Credit
		Theory	Practical	
CC	14	$14 \times 4 = 56$	$14 \times 2 = 28$	$56 + 28 = 84$
DSE	4	$4 \times 4 = 16$	$4 \times 2 = 08$	$16 + 8 = 24$
GE	4	$4 \times 4 = 16$	$4 \times 2 = 8$	$16 + 8 = 24$
SEC	2	$2 \times 2 = 4$		04
AECC	2	$4 \times 2 = 8$		08
<b>Total</b>				<b>144</b>
<b>NON-CGPA</b>				
SEMINAR/MOOKS/OTHER ACTIVITIES	6		1	06
SKILLX/NSS	6		1	06
<b>Grand Total Credit</b>				<b>156</b>
<b><u>Abbreviations used:</u></b>				
CC = CORE COURSES				
DSE = DISCIPLINE SPECIFIC ELECTIVES				
GE = GENERAL ELECTIVES				
SEC = SKILL ENHANCEMENT COURSES				
AECC = ABILITY ENHANCEMENT COMPULSORY COURSES				
<b>List of Core Courses</b>				<b>Semester</b>
(14 Papers for the Students of Biotechnology)				

CORE I	INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY	I
CORE II	BIOCHEMISTRY	
CORE III	MICROBIAL PHYSIOLOGY AND METABOLISM	II
CORE IV	BACTERIOLOGY	
CORE V	MICROBIAL GENETICS	III
CORE VI	MOLECULAR BIOLOGY	
CORE VII	ENVIRONMENTAL MICROBIOLOGY	
CORE VIII	IMMUNOLOGY	IV
CORE IX	BIOINFORMATICS	
CORE X	MEDICAL MICROBIOLOGY	
CORE XI	INDUSTRIAL MICROBIOLOGY	V
CORE XII	RECOMBINANT DNA TECHNOLOGY	
CORE XIII	FOOD AND DAIRY MICROBIOLOGY	VI
CORE XIV	BIOSTATISTICS	

<b>Choices for DSE</b>	
(2 Papers each to be selected by the Students of Biotechnology SemV and SemVI)	
DSE_1	Microbial Biotechnology
DSE_2	Advances in Microbiology
DSE_3	Plant Pathology
DSE_4	Inheritance Biology

DSE_5	Microbes in Sustainable Agriculture and Development
DSE_6	Biosafety and Intellectual Property Rights
DSE_7	Review Writing

<b>Choices for SEC</b>	
(Any one per semester in semesters 3-4)	
SEC_1	Microbial Quality Control in Food and Pharmaceutical Industries
SEC_2	Microbial Diagnosis in Health Clinics
SEC_3	Biofertilizers and Biopesticides
SEC_4	Food Fermentation Techniques
SEC_5	Management of Human Microbial Diseases
SEC_6	Microbiological Analysis of Air and Water

<b>Choices for AECC</b>	
(Any one per semester in semesters 3-4)	
AECC_1	English
AECC_2	Environmental Science
AECC_3	Entrepreneurship Development
AECC_4	Values and Ethics

<b>Choices for GE (Any one per semester in semesters 1-4)</b>
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GE_1	Introduction and Scope of Microbiology
GE_2	Bioanalytical Tools
GE_3	Cell Biology
GE_4	Bacteriology and Virology
GE_5	Entrepreneurship Development
GE_6	Microbial Metabolism
GE_7	Genetic Engineering and Biotechnology
GE_8	Microbes In Food Process Industries

**SEMESTER-I**

SEMESTER	COURSE OPTED	COURSE CODE	COURSE NAME	L	T	P	CREDIT	CONTACT HOURS	
I	CORE I	XMI1001	INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY	3	1	0	4	4	
	CORE I LAB	XMI1101	INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY LAB	0	0	3	2	3	
	CORE II	XMI1002	BIOCHEMISTRY	3	1	0	4	4	
	CORE II LAB	XMI1102	BIOCHEMISTRY LAB	0	0	3	2	3	
	GE I		GENERAL ELECTIVE SUBJECT	3	1	0	4	4	
	GE I LAB		GENERAL ELECTIVE SUBJECT LAB	0	0	3	2	3	
	AECC I	XED1001	ENGLISH	2	0	0	2	2	
	<b>TOTAL</b>							<b>20</b>	<b>23</b>
	<b>NON-CGPA</b>								
		XMI1501	SEMINAR/ MOOKS/OTHER ACTIVITIES	0	0	1	1	1	
		XMI1502	SKILLX/NSS	0	0	1	1	-	
<b>TOTAL</b>							<b>22</b>	<b>24</b>	

### SEMESTER-II

SEMESTER	COURSE OPTED	COURSE CODE	COURSE NAME	L	T	P	CREDITS	CONTACT HOURS	
II	CORE III	XMI2001	MICROBIAL PHYSIOLOGY AND METABOLISM	3	1	0	4	4	
	CORE III LAB	XMI2101	MICROBIAL PHYSIOLOGY AND METABOLISM LAB	0	0	3	2	3	
	CORE IV	XMI2002	BACTERIOLOGY	3	1	0	4	4	
	CORE IV LAB	XMI2102	BACTERIOLOGY LAB	0	0	3	2	3	
	GE II		GENERAL ELECTIVE	3	1	0	4	4	
	GE II LAB		GENERAL ELECTIVE LAB	0	0	3	2	3	
	AECC II		ENVIRONMENTAL SCIENCE	2	0	0	2	2	
	<b>TOTAL</b>							<b>20</b>	<b>23</b>
	<b>NON-CGPA</b>								
		XMI2501	SEMINAR/ MOOKS/OTHER ACTIVITIES	0	0	1	1	1	
		XMI2502	SKILLX/NSS	0	0	0	1	-	
	<b>TOTAL</b>							<b>22</b>	<b>24</b>

### SEMESTER-III

SEMESTER	COURSE OPTED	COURSE CODE	COURSE NAME	L	T	P	CREDIT	CONTACT HOURS	
III	CORE V	XMI3001	MICROBIAL GENETICS	3	1	0	4	4	
	CORE V LAB	XMI3101	MICROBIAL GENETICS LAB	0	0	3	2	3	
	CORE VI	XMI3002	MOLECULAR BIOLOGY	3	1	0	4	4	
	CORE VI LAB	XMI3102	MOLECULAR BIOLOGY LAB	0	0	3	2	3	
	CORE VII	XMI3003	ENVIRONMENTAL MICROBIOLOGY	3	1	0	4	4	
	CORE VII LAB	XMI3103	ENVIRONMENTAL MICROBIOLOGY LAB	0	0	3	2	3	
	GE III		GENERIC ELECTIVE SUBJECTS	3	1	0	4	4	
	GE III LAB		GENERIC ELECTIVE SUBJECTS	0	0	3	2	3	
	SEC I	XMI3004/ XMI3005/ XMI3006	SKILL ENHANCE COURSES (Microbial Quality Control in Food & Pharmaceutical Industries/Microbial Diagnosis in Health Clinics/ Biofertilizers & Biopesticides)	2	0	0	2	2	
	AECC III		ENTREPRENEURSHIP DEVELOPMENT	2	0	0	2	2	
	<b>TOTAL</b>							<b>28</b>	<b>32</b>
	<b>NON-CGPA</b>								
		XMI3501	SEMINAR/ MOOKS/OTHER ACTIVITIES	0	0	1	1	1	
		XMI3502	SKILLX/NSS	0	0	1	1	-	
<b>TOTAL</b>							<b>30</b>	<b>33</b>	

### SEMESTER-IV



SEMESTER	COURSE OPTED	COURSE CODE	COURSE NAME	L	T	P	CREDIT	CONTACT HOURS	
IV	CORE VIII	XMI4001	BIOINFORMATICS	3	1	0	4	4	
	CORE VIII LAB	XMI4101	BIOINFORMATICS LAB	0	0	2	2	3	
	CORE IX	XMI4002	IMMUNOLOGY	3	1	0	4	4	
	CORE IX LAB	XMI4102	IMMUNOLOGY LAB	0	0	2	2	3	
	CORE X	XMI4003	MEDICAL MICROBIOLOGY	3	1	0	4	4	
	CORE X LAB	XMI4103	MEDICAL MICROBIOLOGY LAB	0	0	2	2	3	
	GE IV		GENERIC ELECTIVE	3	1	0	4	4	
	GE IV LAB		GENERIC ELECTIVE LAB	0	0	2	2	3	
	SEC II	XMI4004/ XMI4005/ XMI4006	SKILL ENHANCE COURSES (Food Fermentation Techniques/ Management of Human Microbial Diseases/ Microbiological Analysis of Air & Water)	2	0	0	2	2	
	AECC IV		VALUES AND ETHICS	2	0	0	2	2	
	<b>TOTAL</b>							<b>28</b>	<b>32</b>
	<b>NON-CGPA</b>								
		XMI4501	SEMINAR/ MOOKS/OTHER ACTIVITIES	0	0	1	1	1	
		XMI4502	SKILLX/NSS	0	0	1	1	-	
<b>TOTAL</b>							<b>30</b>	<b>33</b>	

### SEMESTER-V

SEMESTER	COURSE OPTED	COURSE CODE	COURSE NAME	L	T	P	CREDIT	CONTACT HOURS	
V	CORE XI	XMI5001	INDUSTRIAL MICROBIOLOGY	3	1	0	4	4	
	CORE XI LAB	XMI5101	INDUSTRIAL MICROBIOLOGY LAB	0	0	2	2	3	
	CORE XII	XMI5002	RECOMBINANT DNA TECHNOLOGY	3	1	0	4	4	
	CORE XII LAB	XMI5102	RECOMBINANT DNA TECHNOLOGY LAB	0	0	2	2	3	
	DSE I	XMI5003/ XMI5004	DISCIPLINE CENTRIC SUBJECTS I (Microbial Biotechnology/ Advances in Microbiology)	3	1	0	4	4	
	DSE I LAB	XMI5103/ XMI5104	DISCIPLINE CENTRIC SUBJECTS I LAB (Microbial Biotechnology Lab/ Advances in Microbiology Lab)	0	0	2	2	3	
	DSE II	XMI5005/ XMI5006	DISCIPLINE CENTRIC SUBJECTS II (Plant Pathology/ Inheritance Biology)	3	1	0	4	4	
	DSE II LAB	XMI5105/ XMI5106	DISCIPLINE CENTRIC SUBJECTS II LAB (Plant Pathology Lab/ Inheritance Biology Lab)	0	0	2	2	3	
	<b>TOTAL</b>							<b>24</b>	<b>28</b>
	<b>NON-CGPA</b>								
	XMI5501	SEMINAR/ MOOKS/OTHER ACTIVITIES	0	0	1	1	1		
	XMI5502	SKILLX/NSS	0	0	1	1	-		

			<b>TOTAL</b>		<b>26</b>	<b>29</b>
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### SEMESTER-VI

SEMESTER	COURSE OPTED	COURSE CODE	COURSE NAME	L	T	P	CREDIT	CONTACT HOURS
VI	CORE XIII	XMI6001	FOOD AND DAIRY MICROBIOLOGY	3	1	0	4	4
	CORE XIII LAB	XMI6101	FOOD AND DAIRY MICROBIOLOGY LAB	0	0	2	2	3
	CORE XIV	XMI6002	BIOSTATISTICS	3	1	0	4	4
	CORE XIV LAB	XMI6102	BIOSTATISTICS LAB	0	0	2	2	3
	DSE III	XMI6003/ XMI6004	DISCIPLINE CENTRIC SUBJECTS III (Microbes in Sustainable Agriculture and Development/ Biosafety and Intellectual Property Rights)	3	1	0	4	4
	DSE III LAB	XMI6103/ XMI6104	DISCIPLINE CENTRIC SUBJECTS III LAB (Microbes in Sustainable Agriculture and Development Lab/ Biosafety and Intellectual Property Rights Lab)	0	0	2	2	3
	DSE IV	XMI6005	DISCIPLINE CENTRIC SUBJECTS IV (Review Writing)	3	1	0	4	4

	DSE IV LAB	XMI6105	DISCIPLINE CENTRIC SUBJECTS IV LAB (Review Writing)	0	0	2	2	3
<b>TOTAL</b>							<b>24</b>	<b>28</b>
<b>NON-CGPA</b>								
		XMI6501	SEMINAR/ MOOKS/OTHER ACTIVITIES	0	0	1	1	1
		XMI6502	SKILLX/NSS	0	0	1	1	-
<b>TOTAL</b>							<b>26</b>	<b>29</b>