

KERALA AGRICULTURAL UNIVERSITY

PROCEEDINGS

KAU – Edn-Modification of the syllabus of B.Tech (Biotechnology) degree programme in accordance with the fifth Dean's Committee Report– Approved- Orders issued.

DIRECTORATE OF EDUCATION

No. Acad.B2/2022/101/12636(iii)

Vellanikkara, Dated: 27.10.2022

Read: - 1. Minutes of 64th meeting of the Board of Studies, Faculty of Agriculture, Item 6/64
2. Minutes of the 138th meeting of Academic Council held on 22.07.2022

ORDER

A proposal to modify the syllabus of B.Tech. (Biotechnology) degree programme in accordance with the fifth Dean's Committee Report was approved by the 64th meeting of the Board of Studies (Faculty of Agriculture) held on 07.07. 2022.The proposal has been placed before the 138th meeting of the Academic Council held on 22.07.2022

In consonance with the decision of the 138th meeting of Academic Council, the following orders are issued.

The syllabus of the B.Tech (Biotechnology) degree programme is modified in accordance with the Fifth Dean's Committee Report .

The modified syllabus annexed with this order is available in www.kau.in

//By order of the Academic Council//

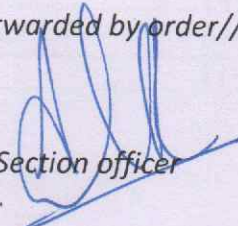
Dr.S.GOPAKUMAR
DIRECTOR OF EDUCATION

To

1. Deans of Faculty/ Deans of all colleges under KAU/ Director, DIS
2. The Controller of Examinations
3. Academic Officers of all colleges under KAU
4. Jr. Programmer, (Acad), KAU (for publishing in the website)

Copy to: PS to VC/PA to Registrar/Steno to Director of Education/ Professor (Acad)/Joint Registrar (Acad)/Section Officer Acad B, Acad C/SF /Spare.

//Forwarded by order//


Section officer

B. Tech. (Biotechnology) Syllabus

The curriculum has a total of **177 credit hours** including **5 non-credit hours**.

1. General courses (8 Nos.) Total credit hours= 11+9= 20

Sl. No.	Course Code	Course Title	Credit hours	Department
1	BECO 2101	Economics and marketing	2+1	Agril. Econ.
2	BEXT 1101	Effective communication and personality development	1+1	Agril. Extn.
3	BEXT 1102	Human ethics	1+0	Agril. Extn.
4	BEXT 2203	Entrepreneurship development and business management	1+1	Agril. Extn.
5	BCOM 3101	Food science and processing	1+1	Community Science
6	BSAC 2203	Environmental studies and disaster management	2+1	SS&AC
7	BSTA 2103	Information and communication technology	1+1	Agril. Stat.
8	BSTA 3106	Agricultural informatics	1+2	Agril. Stat.
9	BENG 3102	Renewable energy and green technology	1+1	Agril. Engg.

2. Biotechnology Core Courses (24 Nos.) Total credit hours = 41 + 19=60

Sl. No.	Course Code	Course Title	Credit hours	Department
1	BENG 2201	Electronics and instrumentation in biotechnology	1+1	Agril. Engg. /Plant Biotech.
2	BMIC 1201	Fundamentals of microbiology	2+1	Agril. Micro.
3	BMIC 2202	Microbial genetics	1+1	Agril. Micro.
4	BPPG 1101	Basic genetics	2+1	Pl. Breed. & Gen.
5	BPPG 1102	Cell biology and cytogenetics	2+1	Pl. Breed. & Gen.
6	BPPG 1203	Biodiversity and bioprospecting	2+0	Pl. Breed. & Gen.
7	BPPG 3106	Molecular marker technology	1+1	Pl. Breed. & Gen.
8	BPBT 1101	Introduction to biotechnology	2+1	Plant Biotech.
9	BPBT 1202	Molecular biology	2+1	Plant Biotech.
10	BPBT 2103	Recombinant DNA technology	1+1	Plant Biotech.
11	BPBT 2104	Plant tissue culture	2+1	Plant Biotech.
12	BPBT 2105	Introductory bioinformatics	2+1	Plant Biotech.
13	BPBT 2206	Plant genetic transformation	1+1	Plant Biotech.
14	BPBT 2208	Animal biotechnology	2+1	Plant Biotech.
15	BPBT 2209	Molecular genetics	2+0	Plant Biotech.
16	BPBT 2210	Nanobiotechnology	2+0	Plant Biotech.
17	BPBT 2211	Genomics and proteomics	2+0	Plant Biotech.
18	BPBT 3112	Immunology	1+1	Plant Biotech.

19	BPBT 3113	Biosafety and IPR in biotechnology	2+0	Plant Biotech.
20	BPBT 3114	Computational biology	2+1	Plant Biotech.
21	BPBT 3115	Bioprocess engineering in biotechnology	2+1	Plant Biotech.
22	BSAC 1101	Principles of analytical chemistry	1+1	SS& AC
23	BSAC 1202	General biochemistry	2+1	SS & AC
24	BSAC 3104	Enzymology and enzyme technology	2+1	SS & AC

3. *Elective Courses in Biotechnology (one to choose) Total Credit Hours = 18

Sl. No.	Course Code	Course Title	Credit hours	Department
Elective I. Plant Biotechnology Total credit hours = 12 + 6 = 18				
1	BELB 3201	Commercial micropropagation of crop plants	2+1	Plant Biotech.
2	BELB 3202	Epigenetics and gene regulation	2+1	Plant Biotech.
3	BELB 3203	Omics in plant biotechnology	2+1	Plant Biotech.
4	BELB 3204	Principles and applications of plant genetic transformation	2+1	Plant Biotech.
5	BELG 3201	Molecular breeding of crop plants	2+1	Pl. Breed. & Gen.
6	BELP 3201	Molecular diagnosis of plant pathogens	2+1	Plant Path.
Elective II. Animal Biotechnology Total credit hours 13 + 5 = 18				
	BELB 3205	Principles and Procedures of Animal cell culture	2+1	Plant Biotech.
2	BELB 3206	Animal genomics	2+1	Plant Biotech.
3	BELB 3207	Embryo transfer technologies	2+1	Plant Biotech.
4	BELB 3208	Transgenic animal production	3+0	Plant Biotech.
5	BELP 3202	Molecular diagnostics	2+1	Plant Path.
6	BELP 3203	Molecular virology and vaccine production	2+1	Plant Path.
Elective III. Bioinformatics Total credit hours= 11 + 7 = 18				
1	BELB 3209	Programming for bioinformatics	2+2	Plant Biotech.
2	BELB 3210	Bioinformatics tools and biological databases	2+1	Plant Biotech.
3	BELB 3211	Structural bioinformatics	2+1	Plant Biotech.
4	BELB 3212	Pharmacogenomics	2+1	Plant Biotech.
5	BELB 3213	Metabolomics and system biology	2+1	Plant Biotech.
6	BELB 3214	Computational methods for data analysis	1+1	Plant Biotech.
Elective IV. Microbial and Environmental Biotechnology Total credit hours 14 + 4 = 18				
1	BELM 3201	Microbial biotechnology	2+1	Agril. Micro.
2	BELM 3202	Bio-prospecting of molecules and genes	3+0	Agril. Micro.
3	BELM 3203	Molecular ecology and evolution	3+0	Agril. Micro.

4	BELM 3204	Fundamentals of molecular pharming and biopharmaceuticals	2+1	Agril. Micro.
5	BELM 3205	Food biotechnology	2+1	Agril. Micro.
6	BELM 3206	Green biotechnology	2+1	Agril. Micro.

*Will be offered based on the availability of faculty and facility

4. Basic Science Courses (8 Nos.) Total Credit hours = 13 + 6=19

Sl. No.	Course Code	Course Title	Credit hours	Department
1	BAHB 1101	Basic zoology	2+1	Animal Hus
2	BPBG 1204	Introduction to agricultural botany	2+1	Plant Breed. & Gen.
3	BPBT 2207	Biophysics	2+0	Plant Biotech.
4	BPHY 2101	Crop physiology	2+1	Plant Physiol.
5	BSTA 1101	Basic mathematics	2+0	Agril. Stat.
6	BSTA 1202	Basic statistics	1+1	Agril. Stat.
7	BSTA 2104	Biomathematics	1+1	Agril. Stat.
8	BSTA 3105	Biostatistics	1+1	Agril. Stat.

5. Agriculture & Allied Courses (6Nos.) Total Credit Hours = 10+ 5=15

Sl. No.	Course Code	Course Title	Credit hours	Department
1	BAGR 1101	Basic agronomy and production technology of major crops	2+1	Agronomy
2	BHOR 2101	Production technology for horticultural crops	2+1	PCS/Vs/FS/FLA
3	BPBG 1205	Basics and methods of plant breeding	2+1	Pl. Breed. & Gen.
4	BPEN 1201	Fundamentals of crop protection	2+1	Plant Path. & Agril. Ento.
5	BPHT 2101	Postharvest technology	2+1	PHT

6. Student READY Programme (3 Nos.) Total Credit hours =0+40= 40

Sl. No.	Catalogue No.	Course Title	Credit hours	Department
1	BSRP 4101 BSRP 4102 BSRP 4103 BSRP 4104	In-house Skill Development Modules 1. Plant biotechnology (0+20) 2. Animal biotechnology (0+20) 3. Bioinformatics (0+20) 4. Microbial and environmental biotechnology (0+20)	0+20	
2	BSRP 4205	Project formulation, execution and presentation	0+4	
3	BSRP 4206	Entrepreneurial development in biotechnology (on-campus /off campus)	0+16	

7. Non-Credit Courses (5 Nos.)

Total Credit hours = 0+5=5

Sl. No.	Catalogue No.	Course Title	Non-Credit hours
1	B EGL 1101	Comprehension and communication skills in English	0+1
2	B NSS 1101	NCC/NSO/NSS	0+1
3	B PED 1201	Physical education and yoga practices	0+1
4	B STR 3201	Educational tour I (All India)	0+1
5	B STR 4102	Educational tour II (All Kerala)	0+1

Name of Departments

Animal Hus.	- Department of Animal Husbandry
Agril. Econ.	- Department of Agricultural Economics
Agril. Engg.	- Department of Agricultural Engineering
Agril. Ento.	- Department of Agricultural Entomology
Agril. Extn.	- Department of Agricultural Extension Agril.
Micro.	- Department of Agricultural Microbiology Agril.
Stat.	- Department of Agricultural Statistics
Agron.	- Department of Agronomy
COM	- Department of Community Science
FLA	- Department of Floriculture, Landscape and Architecture
FS	- Department of Fruit Science
PCS	- Department of Plantation Crops and Spices
PHT	- Department of Postharvest Technology
Plant Biotech.	- Department of Plant Biotechnology
Pl. Breed. & Gen.	- Department of Plant Breeding and Genetics Plant
Path.	- Department of Plant Pathology
Plant Physiol.	- Department of Plant Physiology
SS & AC	- Department of Soil Science and Agricultural Chemistry
VS	- Department of Vegetable Science

Semester-wise Distribution of Courses

Semester I		
Catalogue No.	Course Title	Credit hours
BAGR 1101	Basic agronomy and production technology of major crops	2+1
BAHB 1101	Basic zoology	2+1
BEXT 1101	Effective communication and personality development	1+1
BEXT 1102	Human ethics	1+0
B PBG 1101	Basic genetics	2+1
B PBG 1102	Cell biology and cytogenetics	2+1
B PBT 1101	Introduction to biotechnology	2+1
BSAC 1101	Principles of analytical chemistry	1+1
BSTA 1101	Basic mathematics	2+0
B EGL 1101	Comprehension and communication skills in English (NC)	0+1
B NSS 1101	NCC/NSO/NSS (NC)	0+1
	Total	15 + 7 + 2 NC = 24

Semester II		
Catalogue No.	Course Title	Credit hours
BMIC 1201	Fundamentals of microbiology	2+1
BPBG 1203	Biodiversity and bioprospecting	2+0
BPBG 1204	Introduction to agricultural botany	2+1
BPBG 1205	Basics and methods of plant breeding	2+1
BPBT 1202	Molecular biology	2+1
BPEN 1201	Fundamentals of crop protection	2+1
BSAC 1202	General biochemistry	2+1
BSTA 1202	Basic statistics	1+1
BPED 1201	Physical education and yoga practices (NC)	0+1
Total		15 + 7 + 1 NC = 23

Semester III		
Catalogue No.	Course Title	Credit hours
BECO 2101	Economics and marketing	2+1
BHOR 2101	Production technology for horticultural crops	2+1
BPBT 2103	Recombinant DNA technology	1+1
BPBT 2104	Plant tissue culture	2+1
BPBT 2105	Introductory bioinformatics	2+1
BPHT 2101	Postharvest technology	2+1
BPHY 2101	Crop physiology	2+1
BSTA 2103	Information and communication technology	1+1
BSTA 2104	Biomathematics	1+1
Total		15 + 9 = 24

Semester IV		
Catalogue No.	Course Title	Credit hours
BENG 2201	Electronics and instrumentation in biotechnology	1+1
BEXT 2203	Entrepreneurship development and business management	1+1
BMIC 2202	Microbial genetics	1+1
BPBT 2206	Plant genetic transformation	1+1
BPBT 2207	Biophysics	2+0
BPBT 2208	Animal biotechnology	2+1
BPBT 2209	Molecular genetics	2+0
BPBT 2210	Nanobiotechnology	2+0
BPBT 2211	Genomics and proteomics	2+0
BSAC 2203	Environmental studies and disaster management	2+1
Total		16 + 6 = 22

Semester V		
Catalogue No.	Course Title	Credit hours
BENG 3102	Renewable energy and green technology	1+1
BPBG 3106	Molecular marker technology	1+1
BPBT 3112	Immunology	1+1

BPBT 3113	Biosafety and IPR in biotechnology	2+0
BSTA 3106	Agricultural Informatics	1+2
BPBT 3114	Computational biology	2+1
BPBT 3115	Bioprocess engineering in biotechnology	2+1
BCOM 3101	Food science and processing	1+1
BSAC 3104	Enzymology and enzyme technology	2+1
BSTA 3105	Biostatistics	1+1
	Total	14 + 10 = 24

Semester VI		
Catalogue No.	Course Title	Credit hours
Optional courses listed	Optional/Elective courses Only one can be chosen	18
	1. Plant biotechnology	12+6
	2. Animal biotechnology	13+5
	3. Bioinformatics	11+7
	4. Microbial and environmental biotechnology	14+4
BSTR 3201	Educational tour I (All India) (NC)	0 + 1
	Total	18 + 1 NC = 19

Semester VII		
Catalogue No.	Course No.	Credit hours
	Student READY - In-house Skill development modules Four Modules (Only one to be opted as per chosen elective)	0+20
BSRP 4101	1. Plant biotechnology (0+20)	
BSRP 4102	2. Animal biotechnology (0+20)	
BSRP 4103	3. Bioinformatics (0+20)	
BSRP 4104	4. Microbial and environmental biotechnology (0+20)	
BSTR 4102	Educational tour II (All Kerala)	0+1
	Total	0 + 20 + (1 NC) = 21

Semester VIII		
Catalogue No.	Course Title	Credit hours
BSRP 4205	Student READY –Project formulation, execution and presentation (Four Weeks)	0 + 4
BSRP 4206	Student READY - Entrepreneurial development in biotechnology (On-campus/Off-Campus)	0 + 16
	Total	0 + 20 = 20
	Grand Total	172 + 5 (NC) = 177 credits