Course Curriculum for B. Tech Agricultural Engineering Programme

Semester – I

Sl. No.	Category	Course Code	Course Title	Hours per Week				Credits
				L	T	P	Total	
A. THEORY								
1	Basic Science Course	CH101	Chemistry	3	0	0	3	3
2	Basic Science Course	M101	Mathematics –I	3	1	0	4	4
3	Engineering Science Courses	EE101	Basic Electrical Engineering	3	0	0	3	3
B. PRACTICAL								
4	Basic Science Course	CH191	Chemistry Lab	0	0	3	3	1.5
5	Engineering Science Courses	EE 191	Basic Electrical Engineering Lab	0	0	3	3	1.5
6	Engineering Science Courses	ME 192	Engineering Graphics & Design Lab	0	0	3	3	1.5
7	PROJECT	PR191	Theme based Project I	0	0	1	1	0.5
8	PROJECT	PR192	Skill Development I: Life Skill-I	0	0	1	1	0.5
C. MANDATORY ACTIVITIES / COURSES*								
9	Mandatory Course	MC181	Induction Program	2	0	0	2	2 Units
TOTAL CREDIT								**15.5**

*After successful completion of MC181 a student will acquire 2Units of mandatory course knowledge as mandated by AICTE.

Semester – II

Sl. No.	Category	Course Code	Course Title	Hours per Week				Credits
				L	T	P	Total	
A. THEORY								
1	Basic Science Courses	PH 201	Physics-I	3	0	0	3	3
2	Basic Science Courses	M 201	Mathematics –II	3	1	0	4	4
3	Humanities and Social Sciences including Management Courses	HSMC 201	Professional Communication	2	0	0	2	2
4	Engineering Science Courses	CS 201	Programming for Problem Solving	3	0	0	3	3
B. PRACTICAL								
5	Basic Science course	PH 291	Physics-I Lab	0	0	3	3	1.5
6	Humanities and Social Sciences including Management Courses	HSMC 291	Professional Communication LAB	0	0	2	2	1
7	Engineering Science Courses	ME 291	Workshop & Manufacturing Practices Lab	0	0	3	3	1.5
8	Engineering Science Courses	CS 291	Programming for Problem Solving Lab	0	0	3	3	1.5
9	PROJECT	PR291	Theme based Project II	0	0	1	1	0.5
10	PROJECT	PR292	Skill Development II: Life Skill-II	0	0	1	1	0.5
C. MANDATORY ACTIVITIES / COURSES*								
11	Mandatory Course	MC281	NSS/ Physical Activities / Meditation & Yoga / Photography/ Nature Club	0	0	2	2	2 Units
TOTAL CREDIT								**18.5**

*After successful completion of MC281 a student will acquire 3Units of mandatory course knowledge as mandated by AICTE.

Semester – III

Sl. No.	Category	Course Code	Course Title	Hours per Week				Credits
				L	T	P	Total	
A. THEORY								
1	Basic Science course	M 301	Mathematics III	3	0	0	3	3
2	Engineering Science Courses	EE 301	Circuit Theory and Network	2	0	0	2	2
3	Engineering Science Courses	M(CS)301	Numerical Analysis and Computer Programming	2	0	0	2	2
4	Program Core Course	AE 301	Agriculture & Horticulture for Engineers	2	0	0	2	2
5	Program Core Course	AE 302	Soil Science	2	0	0	2	2
6	Program Core Course	AE 303	Farm Engines & Tractors	2	0	0	2	2
7	Program Core Course	AE 304 (ME 504)	Kinematics and Dynamics of Machine	3	0	0	3	3
8	Humanities and Social Sciences including Management courses	HSMC 302	Gender Culture and Development	2	0	0	2	2
B. PRACTICAL								
9	Engineering Science Courses	EE 391	Circuit Theory and Network lab	0	0	2	2	1
10	Engineering Science Courses	M(CS)391	Numerical Analysis and Computer Programming lab	0	0	2	2	1
11	Program Core Course	AE 391	Agriculture & Horticulture for Engineers Lab	0	0	2	2	1
12	Program Core Course	AE 392	Soil Science Lab	0	0	2	2	1
13	Program Core Course	AE 393	Farm Engines & Tractors Lab	0	0	2	2	1
14	PROJECT	PR391	Theme based Project III	0	0	1	1	0.5
15	PROJECT	PR392	Skill Development III: Life Skill-III	0	0	1	1	0.5
C. MANDATORY ACTIVITIES / COURSES*								
16	MC	MC 381	Learning an Art Form [vocal or instrumental, dance, painting, clay modeling, etc.] OR Environmental Protection Initiatives	0	0	2	2	2Units
TOTAL CREDIT WITHOUT MOOCS COURSES								**24**
D. MOOCS COURSES**								
17	MOOCS COURSES	HM301	MOOCS COURSE-I	2	2	0	4	4
TOTAL CREDIT WITH MOOCS COURSES							**30+4**	**28**

*After successful completion of MC381 a student will acquire 3Units of mandatory course knowledge as mandated by AICTE.

**** MOOCS COURSES for HONOURS/MINOR Degree are Program specific and to be taken from MOOCS BASKET**

Semester – IV

Sl. No.	Category	Course Code	Course Title	Hours per Week				Credits
				L	T	P	Total	
A. THEORY								
1	HSMC	HSMC 401	Universal Human Values 2: Understanding Harmony	3	0	0	3	3
2	BS	MS (PH) 401	Material Science	2	0	0	2	2
3	ES	ME (AE) 401	Strength of Materials	3	0	0	3	3
4	PC	AE 401	Fluid Mechanics & Open Channel Hydraulics	2	0	0	2	2
5	PC	AE 402	Surveying and Leveling	2	0	0	2	2
6	PC	AE 403	Renewable Energy Sources	2	0	0	2	2
7	PE	PEC 401	Professional Elective-I A. Engineering Properties of Agricultural Produce B. Aquacultural Engineering C. Watershed Planning & Management	2	0	0	2	2
B. PRACTICAL								
8	BS	MS (PH) 491	Material Science Lab	0	0	2	2	1
9	PC	AE 491	Fluid Mechanics & Open channel Hydraulics Lab	0	0	2	2	1
10	PC	AE 492	Surveying and Leveling Lab	0	0	3	3	1.5
11	PC	AE 493	Renewable Energy Sources Lab	0	0	2	2	1
12	PE	PEC 491	Professional Elective-I Lab A. Engineering Properties of Agricultural Produce Lab B. Aquacultural Engineering Lab C. Watershed Planning & Management Lab	0	0	2	2	1
13	PROJECT	PR 491	Theme based Project IV	0	0	1	1	0.5
14	PROJECT	PR492	Skill Development IV: Soft Skill & Aptitude	0	0	1	1	0.5
C. MANDATORY ACTIVITIES / COURSES*								
15	MC	MC 401	Environmental Science	0	0	2	2	2 Units
TOTAL CREDIT WITHOUT MOOCS COURSES								**22.5**
D. MOOCS COURSES**								
16	MOOCS COURSES	HM401	MOOCS COURSE-II	2	2	0	4	4
TOTAL CREDIT WITH MOOCS COURSES							**29+4**	**26.5**

*After successful completion of MC401 a student will acquire 3Units of mandatory course knowledge as mandated by AICTE.

**** MOOCS COURSES for HONOURS/MINOR Degree are Program specific and to be taken from MOOCS BASKET**

Semester – V

Sl. No.	Category	Course Code	Course Title	Hours per Week				Credits
				L	T	P	Total	
A. THEORY								
1	HSMC	HSMC 504	Economics for Engineers	2	0	0	2	2
2	ES	CE (AE) 501	Soil Mechanics	2	0	0	2	2
3	PC	AE 502	Machine Design	2	0	0	2	2
4	PC	AE 503	Hydrology and Water Resource Engineering	2	0	0	2	2
5	PC	AE 504	Crop Process Engineering	2	0	0	2	2
6	PC	AE 505	Farm Machinery & Equipment-I	2	0	0	2	2
7	PE	PEC 501	Professional Elective-II A. Ground Water, Wells & Pumps B. Human Engineering & Safety C. Process Equipment Design	2	0	0	2	2
B. PRACTICAL								
8	ES	CE (AE) 591	Soil Mechanics Lab	0	0	3	3	1.5
9	PC	AE 592	Machine Design Lab	0	0	2	2	1
10	PC	AE 593	Hydrology and Water Resource Engineering Lab	0	0	2	2	1
11	PC	AE 594	Crop Process Engineering Lab	0	0	2	2	1
12	PC	AE 595	Farm Machinery & Equipment-I Lab	0	0	2	2	1
13	PE	PEC 591	Professional Elective-II lab A. Ground Water, Wells & Pumps Lab B. Human Engineering & Safety Lab C. Process Equipment Design Lab	0	0	2	2	1
14	PROJECT	PR 591	Minor Project I	0	0	2	2	1
15	PROJECT	PR 592	Skill Development V: Seminar & Group Discussion-I	0	0	1	1	0.5
C. MANDATORY ACTIVITIES / COURSES*								
16	MC	MC 501	Intellectual Property Right	0	0	2	2	2 Units
TOTAL CREDIT WITHOUT MOOCS COURSES								**22**
D. MOOCS COURSES**								
17	MOOCS COURSES	HM501	MOOCS COURSE-III	2	2	0	4	4
TOTAL CREDIT WITH MOOCS COURSES							**30+4**	**26**

*After successful completion of MC501 a student will acquire 3Units of mandatory course knowledge as mandated by AICTE.

**** MOOCS COURSES for HONOURS/MINOR Degree are Program specific and to be taken from MOOCS BASKET**

Semester – VI

Sl. No.	Category	Course Code	Course Title	Hours per Week				Credits
				L	T	P	Total	
A. THEORY								
1	HSMC	HU 605	Principles of Management	2	0	0	2	2
2	PC	AE 601	Field Operation and Maintenance of Tractors and Farm Machinery	2	0	0	2	2
3	PC	AE 602	Farm Machinery and Equipment-II	2	0	0	2	2
4	PC	AE 603	Soil and Water Conservation Engineering	2	0	0	2	2
5	PE	PEC 601	Professional Elective-III A. Sprinkler and Micro Irrigation Systems B. Farm Machinery Design & Production C. Drying and Storage Engineering	2	0	0	2	2
6	OE	OEC 601	Open Elective-I A. Refrigeration & Air Conditioning B. Heat and Mass Transfer C. Design of Machine Elements	3	0	0	3	3
B. PRACTICAL								
7	PC	AE 691	Field Operation and Maintenance of Tractors and Farm Machinery Lab	0	0	3	3	1.5
8	PC	AE 692	Farm Machinery and Equipment-II Lab	0	0	3	3	1.5
9	PC	AE 693	Soil and Water Conservation Engineering Lab	0	0	3	3	1.5
10	PE	PEC 691	Professional Elective-III Lab A. Sprinkler and Micro Irrigation Systems Lab B. Farm Machinery Design & Production Lab C. Drying and Storage Engineering Lab	0	0	3	3	1.5
11	OE	OEC 691	Open Elective-I Lab A. Refrigeration & Air Conditioning Lab B. Heat and Mass Transfer Lab C. Design of Machine Elements Lab	0	0	3	3	1.5
12	PROJECT	PR 691	Minor Project II	0	0	2	2	1
13	PROJECT	PR 692	Skill Development VI: Seminar & Group Discussion-II	0	0	1	1	0.5
C. MANDATORY ACTIVITIES / COURSES*								
14	MC	MC 601	Constitution of India	2	0	0	2	2Units
TOTAL CREDIT WITHOUT MOOCS COURSES								**22**
D. MOOCS COURSES**								
15	MOOCS COURSES	HM601	MOOCS COURSE-IV	2	2	0	4	4
TOTAL CREDIT WITH MOOCS COURSES							**31+4**	**26**

*After successful completion of MC601 a student will acquire 3Units of mandatory course knowledge as mandated by AICTE.

**** MOOCS COURSES for HONOURS/MINOR Degree are Program specific and to be taken from MOOCS BASKET**

Semester – VII

Sl No	Category	Course Code	Course Title	Hours per Week				Credits
				L	T	P	Total	
A. THEORY								
1	PC	AE 701	Irrigation & Drainage Engineering	2	0	0	2	2
2	PC	AE 702	Dairy & Food Engineering	2	0	0	2	2
3	PE	PEC701	Professional Elective-IV A. Seed Processing Technology B. Waste and By-product Utilization C. Tractor Design and Testing	2	0	0	2	2
4	OE	OEC 701	Open Elective-II A. CAD / CAM Computer Graphics & Machine Drawing B. Building Construction & Cost Estimation C. Sensors and Transducers	3	0	0	3	3
B. PRACTICAL								
5	PC	AE 791	Irrigation & Drainage Engineering Lab	0	0	3	3	1.5
6	PC	AE 792	Dairy & Food Engineering Lab	0	0	3	3	1.5
7	PE	PEC 791	Professional Elective-IV Lab A. Seed Processing Technology Lab B. Waste and By-product Utilization Lab C. Tractor Design and Testing Lab	0	0	3	3	1.5
8	OE	OEC 791	Open Elective-II Lab A. CAD / CAM Computer Graphics & Machine Drawing Lab B. Building Construction & Cost Estimation Lab C. Sensors and Transducers Lab	0	0	3	3	1.5
9	PROJECT	PR 791	Major Project-I	0	0	0	4	2
10	PROJECT	PR 792	Industrial Training / Internship	0	0	0	0	1
C. MANDATORY ACTIVITIES / COURSES*								
11	MC	MC 781	Entrepreneurship & Innovation Skill	0	0	2	2	2 Units
TOTAL CREDIT WITHOUT MOOCS COURSES								**18**
D. MOOCS COURSES**								
12	MOOCS COURSES	HM701	MOOCS COURSE-V	2	2	0	4	4
TOTAL CREDIT WITH MOOCS COURSES							**25+4**	**22**

*After successful completion of MC781, a student will acquire 3Units of mandatory course knowledge as mandated by AICTE.

**** MOOCS COURSES for HONOURS/MINOR Degree are Program specific and to be taken from MOOCS BASKET**

*Collective Data from 3rd to 6th Semester (Summer/Winter Training during Semester Break & Internship should be done after 5th Semester or 6th Semester). All related certificates to be collected by the training/internship coordinator(s).

Semester – VIII

Sl No	Category	Course Code	Course Title	Hours per Week				Credits
				L	T	P	Total	
A. THEORY								
1	PE	PEC 801	Professional Elective-V A. Food Packaging Technology B. Precision Farming & Protected Cultivation C. Food Quality & Control	2	0	0	2	2
2	OE	OEC 801	Open Elective-III A. Web Design and Internet Application B. Statistics for Experiments C. Electrical Machines	3	0	0	3	3
3	OE	OEC 802	Open Elective-IV A. Remote Sensing & GIS Application B. Human Resource Management C. Artificial Intelligence & Machine Learning	3	0	0	3	3
B. PRACTICAL								
4	PE	PEC 891	Professional Elective-V Lab A. Food Packaging Technology Lab B. Precision Farming & Protected Cultivation Lab C. Food Quality & Control Lab	0	0	0	2	1
5	OE	OEC 891	Open Elective-III Lab A. Web Design and Internet Application Lab B. Statistics for Experiments Lab C. Electrical Machines Lab	0	0	3	3	1.5
6	OE	OEC 892	Open Elective-IV Lab A. Remote Sensing & GIS Application Lab B. Human Resource Management Lab C. Artificial Intelligence & Machine Learning Lab	0	0	3	3	1.5
7	PROJECT	PR 891	Major Project-II	0	0	0	12	6
8	PROJECT	PR 892	Grand Viva	0	0	0	0	1
C. MANDATORY ACTIVITIES / COURSES								
9	MC	MC 881	Essence of Indian Knowledge Tradition	0	0	2	2	2 Units
TOTAL CREDIT								**19**

Credit Distribution Semester Wise

Category	Semesters								Credits		AICTE Range (%)
	I	II	III	IV	V	VI	VII	VIII	Total	%	
HSMC – Humanities & Social Sciences including Management Courses	-	3	2	3	2	2	-	-	**12**	**7.43**	**5 to 10**
BS – Basic Science Courses	8.5	8.5	3	3	-	-	-	-	**23**	**14.24**	**15 to 20**
ES – Engineering Science and Skills	6	6	6	3	3.5	-	-	-	**24.5**	**15.17**	**15 to 20**
PC – Professional Core Courses	-	-	12	9.5	12	10.5	7	-	**51**	**31.58**	**30 to 40**
PE – Professional Elective Courses Related to Chosen Specialization / Branch	-	-	-	3	3	3.5	3.5	3	**16**	**9.91**	**10 to 15**
OE – Open Electives from other Technical and/or Emerging Subjects	-	-	-	-	-	4.5	4.5	9	**18**	**11.15**	**5 to 10**
PR - Project Work, Seminar and Internship in industry or elsewhere	1	1	1	1	1.5	1.5	3	7	**17**	**10.52**	**10 to 15**
MC – Mandatory Courses (No Credit Course)	0	0	0	0	0	0	0	0	**-**	**-**	**-**
HM – Moocs Courses for Honors Degree	-	-	4	4	4	4	4	-			**-**
Total (Without MOOCS)	**15.5**	**18.5**	**24**	**22.5**	**22**	**22**	**18**	**19**	**161.5**	**100**	**-**
Total (With MOOCS)	**15.5**	**18.5**	**28**	**26.5**	**26**	**26**	**22**	**19**	**181.5**	**-**	**-**

MOOCS COURSES

MOOCs (It is expected that Options in a vertical column would lead to expertise in a specific/allied domain)						
	Semesters	**Credits**	**Option-1 Honors in Farm Machinery and Power**	**Option-2 Honors in Soil and Water Engineering**	**Option-3 Honors in Post-Harvest Engineering**	**Option-4 Honors in Food Process Engineering**
MOOCS COURSE-I	III	4	Tractor Systems and Controls	Watershed Hydrology	Post-Harvest Engineering of Cereals Pulses & Oil seeds	Dairy and Food Processing Operations
MOOCS COURSE-II	IV	4	Bio-Energy Systems: Design & Applications	Agricultural Engineering Structures & Rural Engineering	Post-Harvest Engineering of Horticultural Crops	Thermodynamics & Heat Engines
MOOCS COURSE-III	V	4	Mechanics of Tillage & Traction	Waste Land Developments	Development of Processed Products	Instrumentation and Control Engineering
MOOCS COURSE-IV	VI	4	Precision Agriculture & System Management	Minor Irrigation & Command Area Development	Photovoltaic Technology and Systems	Food Plant Design and Management
MOOCS COURSE-V	VII	4	Hydraulic Drives and Controls	Application of plastics in Agriculture	Agriculture Structures and Environmental Control	Food Products and Process Technology

**Define your Hon's/Minor program and identify related 5/6 courses from COURSERA so that a credit point of 18-20 is earned by the student at the end of the final semester. Related BOS would endorse the selection of these courses followed by the necessary intimation at the Academic Council of the Institute.

**To earn Honours /minor degree a student has to 18-20 credit by attending a total of 180-200 hours of MOOCs classes.