

Subject: Inclusion of Emerging areas in the scheme of studies of B.Tech. Courses for the award of Honors with Specialization/Minor Degree.

Kurukshetra University, Kurukshetra offers four B.Tech./UG programmes in Electronics and Communication Engineering, Computer Science and Engineering, Mechanical Engineering and Biotechnology with 160 credits each. Moreover, from the session 2020-21, the Institute has started offering various programmes/nomenclatures for B.Tech Honors with Specialization/Minor Degree in Emerging Areas as shown at next pages. The scheme of studies of B.Tech. Courses has been modified to include these Emerging Areas for the award of Honors with Specialization/Minor Degree subject to the condition that “Honors with Specialization/Minor Degree will cumulatively require additional **18 to 20 credits** in the specified area in addition to the credits essential for obtaining the Under Graduate Degree in Major Discipline (i.e. 160 credits)”. The required additional 18-20 credits may be earned by the students from the list of courses mentioned in **Tables 1-13** which are offered through the “Online Learning Courses provided through SWAYAM platform as per the AICTE (Credit Framework for online learning Course through SWAYAM) Regulations, 2016. The general guidelines for inclusion of SWAYAM courses in the scheme of studies for credit transfer are also specified at the end of this document. However, in future these courses can be replaced/modified by the Institute with the approval of the Board of Studies/Academic Council and courses offered by the Institute/University or other MOOCs platform for such purpose can also be included as per the prevailing conditions. Any such change will be properly notified to the students.

KURUKSHETRA UNIVERSITY, KURUKSHETRA

(Established by the State Legislature Act XII of
1956)

(‘A+’ Grade NAAC Accredited)

Nomenclature for B.Tech. Degree in Emerging Areas of Biotechnology

1. B.Tech. (Hons.) Biotechnology with Specialization in Computer Science and Biology
2. B.Tech. (Hons.) Biotechnology with Specialization in Drug Engineering
3. B.Tech. (Hons.) Biotechnology with Specialization in Genome Engineering and Technology
4. B.Tech. Biotechnology with Minor Degree in Artificial Intelligence and Machine Learning
5. B.Tech. Biotechnology with Minor Degree in Blockchain
6. B.Tech. Biotechnology with Minor Degree in Data Science
7. B.Tech. Biotechnology with Minor Degree in Internet of Things (IoT)
8. B.Tech. Biotechnology with Minor Degree in Cyber Security
9. **B.Tech.** Biotechnology with Minor Degree in 3D Printing
10. B.Tech. Biotechnology with Minor Degree in Electric Vehicles
11. B.Tech. Biotechnology with Minor Degree in Energy Engineering
12. B.Tech. Biotechnology with Minor Degree in Robotics

KURUKSHETRA UNIVERSITY, KURUKSHETRA

(Established by the State Legislature Act XII of 1956)

('A+' Grade NAAC Accredited)

Table 1: List of elective subjects for acquiring additional 18-20 credits for B.Tech (Hons.) with Specialization/Minor Degree in Artificial Intelligence and Machine Learning

Artificial Intelligence and Machine Learning

(Minimum credits to be earned are EIGHTEEN-TWENTY)

Note: Credit of the subject/s which are counted for earning 160 credits of the degree will not be counted for acquiring Hons. with Specialization/Minor Degree.

Sr. No.	Code	Subject Nomenclature
1.	SPMD/AI-1A	Artificial Intelligence; Search Methods For Problem solving
		OR
	SPMD/AI-2A	An Introduction to Artificial Intelligence
2.	SPMD/AI-3A	Artificial Intelligence: Knowledge Representation and Reasoning
	SPMD/AI-4A	Programming, Data Structures and Algorithms in Python
		OR
3.	SPMD/AI-5A	Python for Data Science
4.	SPMD/AI-6A	Introduction to Machine Learning
5.	SPMD/AI-7A	Deep Learning
		OR
	SPMD/AI-8A	Deep Learning for Computer Vision
6.	SPMD/AI-9A	Reinforcement Learning
7.	SPMD/AI-10A	AI: Constraint Satisfaction
8.	SPMD/AI-11A	Computer Vision
9.	SPMD/AI-12A	Natural Language Processing
		OR
	SPMD/AI-13A	Applied Natural Language Processing
10.	SPMD/AI-14A	Practical Machine Learning with Tensorflow
11.	SPMD/AI-15A	Introduction to Data Analytics
		OR
	SPMD/AI-16A	Data Science for Engineers
12.	SPMD/AI-17A	Learning Analytics Tools
13.	SPMD-1A	Design Thinking - A Primer
14.	SPMD-2A	Ethics in Engineering Practice

KURUKSHETRA UNIVERSITY, KURUKSHETRA
(Established by the State Legislature Act XII of 1956)
(‘A+’ Grade NAAC Accredited)

Table 2: List of elective subjects for acquiring additional 18-20 credits for B.Tech (Hons.) with Specialization/Minor Degree in Internet of Things (IoT)

Internet of Things (IoT)

(Minimum credits to be earned are EIGHTEEN-TWENTY)

Note: Credit of the subjects which are counted for earning 160 credits of the degree will not be counted for acquiring Hons. with Specialization/Minor Degree.

Sr. No.	Code	Subject Nomenclature
1.	SPMD/IoT-1A	Introduction to Industry 4.0 and Industrial Internet of Things OR
	SPMD/IoT-2A	Introduction to Internet of Things
2.	SPMD/IoT-3A	Electronic Systems for Sensor Applications
3.	SPMD/IoT-4A	Optical Fiber Sensors OR
	SPMD/IoT-5A	Optical Sensors
4.	SPMD/IoT-6A	Introduction to Machine Learning
5.	SPMD/IoT-7A	Selection of Nanomaterials for Energy Harvesting and Storage Application
6.	SPMD/IoT-8A	Python for Data Science
7.	SPMD/IoT-9A	Deep Learning OR
	SPMD/IoT- I 0A	Deep Learning for Computer Vision
8.	SPMD/IoT-11A	Reinforcement Learning
9.	SPMD/IoT-12A	Cloud computing OR
	SPMD/IoT-13A	Google Cloud Computing Foundations
10.	SPMD/IoT-14A	Modem Application Development
11.	SPMD/IoT-15A	Introduction to Data Analytics OR
	SPMD/IoT-16A	Data Science for Engineers
12.	SPMD/IoT-17A	Computer Networks and Internet Protocol
13.	SPMD/IoT-18A	Introduction to Database Systems
14.	SPMD-1A	Design Thinking — A Primer
15.	SPMD-2A	Ethics in Engineering Practice

KURUKSHETRA UNIVERSITY, KURUKSHETRA
(Established by the State Legislature Act XII of 1956)
(‘A+’ Grade NAAC Accredited)

Table 3; List of elective subjects for acquiring additional 18-20 credits for B.Tech (Hons.) with Specialization/Minor Degree in Blockchain

Blockchain

(Minimum credits to be earned are EIGHTEEN-TWENTY)

Note: Credit of the subject/s which are counted for earning 160 credits- of the degree will not be counted for acquiring Hons. with Specialization/Minor Degree.

Sr. No.	Code	Subject Nomenclature
1.	SPMD/BL-1A	Introduction to Blockchain Technology and Applications
		OR
	SPMD/BL-2A	Blockchain Architecture Design and Use Cases
2.	SPMD/BL-3A	Introduction to Internet of Things
3.	SPMD/BL-4A	Information Security — 5 — Secure Systems Engineering
4.	SPMD/BL-5A	Introduction to Machine Learning
5.	SPMD/BL-6A	Ethical Hacking
6.	SPMD/BL-7A	GPU Architectures and Programming
7.	SPMD/BL-8A	Computer Networks and Internet Protocol
8.	SPMD/BL-9A	Cloud computing
		OR
	SPMD/BL-10A	Google Cloud Computing Foundations
9.	SPMD/BL-1A1	Foundations of Cryptography
10.	SPMD/BL-12A	Information Theory and Coding
11.	SPMD/BL-13A	Introduction to Database Systems
12.	SPMD/BL-14A	Internetwork Security
13.	SPMD-1A	Design Thinking — A Primer
14.	SPMD-2A	Ethics in Engineering Practice

KURUKSHETRA UNIVERSITY, KURUKSHETRA

(Established by the State Legislature Act XII of 1956)

('A+' Grade NAAC Accredited)

Table 4: List of elective subjects for acquiring additional 18-20 credits for B.Tech (Hons.) with Specialization/Minor Degree in Robotics

Robotics

(Minimum credits to be earned are EIGHTEEN-TWENTY)

Note: Credit of the subject/Is which are counted for earning 160 credits of the degree will not be counted for acquiring Hons. with Specialization/Minor Degree.

Sr. No.	Code	Subject Nomenclature
1.	SPMD/R13-1A	Foundations of Cognitive Robotics
2.	SPIVID/RB-2A	Introduction to Robotics
		OR
	SPMD/RB -3A	Robotics
3.	SPMD/RB-4A	Mechanism and Robot Kinematics
4.	SPMD/RB-5A	Computer Architecture and Organization
5.	SPMD/RB-6A	Power Electronics
6.	SPMD/RB-7A	Principle of Hydraulic Machines and System Design
7.	SPMD/RB-8A	Programming, Data Structures and Algorithms Using Python
8.	SPMDTRB-9A	Control Systems
9.	SPMD/RB-10A	Fundamentals of Artificial Intelligence
10.	SPMD/RB-11A	Introduction to Machine Learning
11.	SPMD/RB-12A	Dynamical System and Control
12.	SPMD/RB-13A	Introduction to Embedded System Design
13.	SPMD/RB-14A	Introduction to Internet of Things
		OR
	SPMD/RB-15A	Introduction to Industry 4.0 and Industrial Internet of Things
14.	SPMD-1A	Design Thinking — A Primer
15.	SPMD-2A	Ethics in Engineering Practice

KURUKSHETRA UNIVERSITY, KURUKSHETRA
(Established by the State Legislature Act XII of 1956)
(‘A+’ Grade NAAC Accredited)

Table 5: List of elective subjects for acquiring additional 18-20 credits for 13.Tech (Hons.) with Specialization/Minor Degree in Data Science

Data Science

(Minimum credits to be earned are EIGHTEEN-TWENTY)

Note: Credit of the subjects which are counted for earning 160 credits of the degree will not be counted for acquiring Hons. with Specialization/Minor Degree.

Sr. No.	Code	Subject Nomenclature
1.	SPMD/DS-1A	Python for Data Science
		OR
	SPMD/DS-2A	Programming, Data Structures and Algorithms in Python
2.	SPMD/DS-3A	Introduction to Data Analytics
		OR
	SPMD/DS-4A	Data Science for Engineers
3.	SPMD/DS-5A	Programming, Data Structures and Algorithms in Python
		OR
	SPMD/DS-6A	Python for Data Science
4.	SPMD/DS-7A	Introduction to Machine Learning
5.	SPMD/DS-8A	Deep Learning
		OR
	SPMD/DS-9A	Deep Learning for Computer Vision
6.	SPMD/DS-10A	Reinforcement Learning
7.	SPMD/DS-11A	Artificial Intelligence: Search Methods For Problem solving
		OR
	SPMDIDS-12A	An Introduction to Artificial Intelligence
8.	SPMD/DS-13A	Artificial Intelligence: Knowledge Representation and Reasoning
9.	SPMD/DS-14A	Computer Vision
10.	SPMD/DS-15A	Natural Language Processing
		OR
	SPMD/DS-16A	Applied Natural Language Processing
11.	SPMD/DS-17A	Practical Machine Learning with Tensorflow
12.	SPMD/DS-18A	Learning Analytics Tools
13.	SPMD-1A	Design Thinking — A Primer
14.	SPMD-2A	Ethics in Engineering Practice

KURUKSHETRA UNIVERSITY, KURUKSHETRA
(Established by the State Legislature Act XII of 1956)
(‘A+’ Grade NAAC Accredited)

**Table 6: List of elective subjects for acquiring additional 18-20 credits for B.Tech
(Hons.) with Specialization/Minor Degree in Cyber Security**

Cyber Security

(Minimum credits to be earned are EIGHTEEN-TWENTY)

*Note: Credit of the subject/s which are counted for earning 160 credits of the degree will not
be counted for acquiring lions. with Specialization/Minor Degree.*

Sr. No.	Code	Subject Nomenclature
1.	SPMD/CS-1A	Cryptography And Network Security
2.	SPMDICS-2A	Ethical Hacking
3.	SPMD/CS-3A	Information Security — 5 — Secure Systems Engineering
4.	SPMD/CS-4A	Privacy and Security in Online Social Media
5.	SPMD/CS-5A	Information Theory and Coding
6.	SPMD/CS-6A	Introduction to Information Security
7.	SPMD/CS-7A	Introduction to Cryptology
8.	SPMD/CS-8A	Computational Number Theory & Cryptography
9.	SPMD/CS-9A	Hardware Security
10.	SPMD/CS- I 0A	Intemetwork Security
11.	SPMD/CS-11A	Introduction to Machine Learning
12.	SPMD/CS-12A	introduction to Internet of Things
13.	SPMD-1A	Design Thinking — A Primer
14.	SPMD-2A	Ethics in Engineering Practice

KURUKSHETRA UNIVERSITY, KURUKSHETRA

(Established by the State Legislature Act XII of 1956)

('A+' Grade NAAC Accredited)

**Table 7: List of elective subjects for acquiring additional 18-20 credits for B.Tech
(Hons.) with Specialization/Minor Degree in 3D Printing**

3D Printing

(Minimum credits to be earned are EIGHTEEN-TWENTY)

Note: Credit of the subject/s which are counted for earning 160 credits of the degree will not be counted for acquiring Hons. with Specialization/Minor Degree.

Sr. No.	Code	Subject Nomenclature
1.	SPMD/3D-1A	Rapid Manufacturing
2.	SPMD/3D-2A	Electronics Equipment Integration and Prototype Building
3.	SPMD/3D-3A	Product Design and Development
4.	SPMD/3D-4A	The Future of Manufacturing Business: Role of Additive Manufacturing
5.	SPMD/3D-5A	Functional and Conceptual Design
6.	SPMD/3D-6A	Introduction to Polymer Science
7.	SPMD/3D-7A	Innovation by Design
8.	SPMD/3D-8A	Design, Technology and Innovation
9.	SPMD-1A	Design Thinking — A Primer
10.	SPMD-2A	Ethics in Engineering Practice

KURUKSHETRA UNIVERSITY, KURUKSHETRA

(Established by the State Legislature Act XII of 1956)

('A+' Grade NAAC Accredited)

Table 8: List of elective subjects for acquiring additional 18-20 credits for B.Tech (Hons.) with Specialization/Minor Degree in Electric Vehicles

Electric Vehicles

(Minimum credits to be earned are EIGHTEEN-TWENTY)

Note: Credit of the subject/s which are counted for earning 160 credits of the degree will not be counted for acquiring Hons. with Specialization/Minor Degree.

Sr. No.	Code	Subject Nomenclature
1.	SPMD/EV- 1A	Fundamentals of Electric Vehicles: Technology & Economics
2.	SPMD/EV-2A	Fundamentals of Electrical Engineering
3.	SPMDIEV-3A	Electrical Machines
4.	SPMDIEV-4A	Physics of Materials
		OR
	SPMD/EV-5A	Powder Metallurgy
5.	SPMD/EV-6A	Introduction to CFD
6.	SPMD/EV-7A	Structural Analysis of Nanomaterials
7.	SPMD/EV-8A	Ecology and Environment
8.	SPMD/EV-9A	Dynamic Behavior of Materials
9.	SPMD/EV-10A	Welding of Advanced High Strength Steels for Automotive Applications
10.	SPMD/EV- 11A	Dynamical System and Control
11.	SPMD-1A	Design Thinking - A Primer
12.	SPMD-2A	Ethics in Engineering Practice

KURUKSHETRA UNIVERSITY, KURUKSHETRA
(Established by the State Legislature Act XII of 1956)
(‘A+’ Grade NAAC Accredited)

**Table 9: List of elective subjects for acquiring additional 18-20 credits for B.Tech (Hons.)
with Specialization/Minor Degree in Energy Engineering**

Energy Engineering

(Minimum credits to be earned are EIGHTEEN-TWENTY)

*Note: Credit of the subject/s which are counted for earning 160 credits of the degree will not
be counted for acquiring Hons. with Specialization/Minor Degree.*

Sr. No.	Code	Subject Nomenclature
1.	SPMD/EE-1A	Fundamentals of Conduction and Radiation
		OR
	SPMD/EE-2A	Fundamentals of Convective Heat Transfer
2.	SPMD/EE-3A	Energy Conservation and Waste Heat Recovery
3.	SPMD/EE-4A	Ecology and Environment
4.	SPMD/EE-5A	Energy Economics and Policy
5.	SPMD/EE-6A	Bioenergy
		OR
	SPMD/EE-7A	Waste to Energy Conversion
6.	SPMD/EE-8A	Non-Conventional Energy Resources
		OR
	SPMD/EE-9A	Technologies for Clean and Renewable Energy Production
7.	SPMD/EE-10A	Selection of Nanomaterials for Energy Harvesting and Storage Application
8.	SPMD/EE-11A	Solar Energy Engineering and Technology
9.	SPMD-1A	Design Thinking - A Primer
10.	SPMD-2A	Ethics in Engineering Practice

KURUKSHETRA UNIVERSITY, KURUKSHETRA
(Established by the State Legislature Act XII of 1956)
(‘A+’ Grade NAAC Accredited)

**Table 10: List of elective subjects for acquiring additional 18-20 credits for B.Tech (Hons.)
with Specialization/Minor Degree in Mechatronics**

Mechatronics

(Minimum credits to be earned are EIGHTEEN-TWENTY)

*Note: Credit of the subject/s which are counted for earning 160 credits of the degree will not
be counted for acquiring Hons. with Specialization/Minor Degree.*

Sr. No.	Code	Subject Nomenclature
1.	SPMD/ME-1A	Power Electronics
2.	SPMD/ME-2A	Semiconductor Optoelectronics
OR		
	SPMD/ME-3A	Semiconductor Devices and Circuits
3.	SPMD/ME-4A	Digital Circuits
4.	SPMD/ME-5A	Analog Electronic Circuits
5.	SPMD/ME-6A	Control Systems
OR		
	SPMD/ME-7A	Control Engineering
6.	SPMD/ME-8A	Introduction to Internet of Things
7.	SPMD/ME-9A	Introduction to Fuzzy Set Theory, Arithmetic and Logic
OR		
	SP MD/ME-10A	Switching Circuits and Logic Design
8.	SPMD/M E-11A	Microcontrollers and Applications
9.	SPMD/ME-12A	Introduction to Embedded System Design
10.	SPMD/ME-I3A	Introduction to Robotic
11.	SPMD/ME-14A	Optical Fiber Sensors
12.	SPMD/ME-15A	Automation in Manufacturing
13.	SPMD-1A	Design Thinking - A Primer
14.	SPMD-2A	Ethics in Engineering Practice

KURUKSHETRA UNIVERSITY, KURUKSHETRA
(Established by the State Legislature Act XII of 1956)
(‘A+’ Grade NAAC Accredited)

Table 11: List of elective subjects for acquiring additional 18-20 credits for B.Tech (Hons.) with Specialization/Minor Degree in Computer Science and Biology

Computer Science and Biology

(Minimum credits to be earned are EIGHTEEN-TWENTY)

Note: Credit of the subject's which are counted for earning 160 credits of the degree will not be counted for acquiring Hons. with Specialization/Minor Degree.

Sr. No.	Code	Subject Nomenclature
1.	SPMD/CB-1A	Computational Systems Biology
2.	SPMD/CB-2A	Introduction to Database Systems
3.	SPMD/CB-3A	Introduction to Artificial Intelligence
OR		
	SPMD/CB-4A	Artificial Intelligence Search Methods for Problem Solving
4.	SPMD/CB-5A	Image Signal Processing
5.	SPMD/CB-6A	Introduction to Internet of Things
6.	SPMD/CB-7A	Introduction to Computer Graphics
OR		
	SPMD/CB-8A	Computer Graphics
7.	SPMD/CB-9A	MATLAB Programming for Numerical Computation
8.	SPMD/CB-10A	Programming, Data Structures and Algorithms in Python
9.	SPMD/CB- I 1A	Introduction to Machine Learning
10.	SPMD/CB-12A	Data Mining
11.	SPMD/CB-13A	Introduction to Dynamical Models in Biology
12.	SPMD/CB-14A	Biometrics
13.	SPMD/CB-15A	Bioinformatics: Algorithms and Applications
14.	SPMD/CB-16A	Introduction to Proteogenomics
15.	SPMD/CB-17A	Foundations of Cryptography
16.	SPMD/CB-18A	Modern Application Development
17.	SPMD/CB-19A	Ethical Hacking
18.	SPMD/CB-20A	Computer Aided Drug Design
19.	SPMD/CB-21A	Functional Genomics
20.	SPMD-1A	Design Thinking - A Primer
21.	SPMD-2A	Ethics in Engineering Practice

KURUKSHETRA UNIVERSITY, KURUKSHETRA
(Established by the State Legislature Act XII of 1956)
(‘A+’ Grade NAAC Accredited)

**Table 12: List of elective subjects for acquiring additional 18-20 credits for B.Tech (Hons.)
with Specialization/Minor Degree in Drug Engineering**

Drug Engineering

(Minimum credits to be earned are EIGHTEEN-TWENTY)

Note: Credit of the subject/s which are counted for earning 160 credits of the degree will not be counted for acquiring Hons. with Specialization/Minor Degree.

Sr. No.	Code	Subject Nomenclature
1.	SPMD/DE-1A	Drug Delivery: Principles and Engineering
2.	SPMD/DE-2A	Experimental Biotechnology
3.	SPMD/DE-3A	Spectroscopic Techniques for Pharmaceutical and Biopharmaceutical Industries
4.	SPMD/DE-4A	Environmental Quality Monitoring & Analysis
5.	SPMD/DE-5A	Computer Aided Drug Design
6.	SPMD/DE-6A	Current Regulatory Requirements for Conducting Clinical Trials in India for Investigational New Drugs/New Drug
7.	SPMD/DE-7A	Introduction to Dynamical Models in Biology
8.	SPMD/DE-8A	Medical Biomaterials
9.	SPMD/DE-9A	Metals in Biology
10.	SPMD/DE-10A	Gene Therapy
11.	SPMD/DE-11A	Introduction to Cardiovascular Fluid Mechanics
12.	SPMD/DE-12A	Optical Sensors
13.	SPMD/DE-13A	Nano Structured Materials- Synthesis, Properties, Self-assembly and Applications
14.	SPMD/DE-14A	Transport Phenomena in Biological Systems
15.	SPMD/DE-15A	Aspects of Biochemical Engineering
16.	SPMD/DE-16A	Process Control Design, Analysis and Assessment
17.	SPMD/DE-17A	Industrial Biotechnology
18.	SPMD/DE-18A	Interactomics
19.	SPMD/DE-19A	Health Research Fundamentals
20.	SPMD/DE-20A	Computational Systems Biology
21.	SPMD/DE-21A	Human Molecular Genetics
22.	SPMD-1A	Design Thinking - A Primer
23.	SPMD-2A	Ethics in Engineering Practice

KURUKSHETRA UNIVERSITY, KURUKSHETRA

(Established by the State Legislature Act XII of 1956)

('A+' Grade NAAC Accredited)

Table 13: List of elective subjects for acquiring additional 18-20 credits for B.Tech (Hons.) with Specialization/Minor Degree in Genome Engineering & Technology

Genome Engineering & Technology

(Minimum credits to be earned are EIGHTEEN-TWENTY)

Note: Credit of the subjects which are counted for earning 160 credits of the degree will not be counted for acquiring Hons. with Specialization/Minor Degree.

Sr. No.	Code	Subject Nomenclature
1.	SPMD/GE-1A	Introduction to Proteogenomics
2.	SPMD/GE-2A	Interactomics: Basics & Applications
3.	SPMD/GE-3A	Drug Delivery: Principles and Engineering
4.	SPMD/GE-4A	Experimental Biotechnology
5.	SPMD/GE-5A	Bioengineering: An Interface with Biology and Medicine
6.	SPMD/GE-6A	Functional Genomics
7.	SPMD/GE-7A	Protein and Gel Based Proteomics
8.	SPMD/GE-8A	Cell Culture Technologies
9.	SPMD/GE-9A	Tissue Engineering
10.	SPMD/GE-10A	Biomedical Nanotechnology
11.	SPMD/GE-11A	Introductory Mathematical Methods for Biologists
12.	SPMD/GE-12A	Nanotechnology in Agriculture
13.	SPMD/GE-13A	Introduction to Proteomics
14.	SPMME-14A	Applications of Interactomics using Genomics and Proteomics Technologies
15.	SPMD/GE-15A	Transport Phenomena in Biological Systems
16.	SPMD/GE-16A	Proteomics and Genomics
17.	SPMD/GE-17A	Medical Biomaterials
18.	SPMD/GE-18A	Thermodynamics for Biological Systems: Classical and Statistical Aspect
19.	SPMD/GE-19A	Mass Spectrometry Based Proteomics
20.	SPMD/GE-20A	Advanced Clinical Proteomics
21.	SPMD/GE-21A	Application of Spectroscopic Methods in Molecular Structure Determination
22.	SPMD/GE-22A	Gene Therapy
23.	SPMD-1A	Design Thinking - A Primer
24.	SPMD-2A	Ethics in Engineering Practice

KURUKSHETRA UNIVERSITY, KURUKSHETRA

(Established by the State Legislature Act XII of 1956)

('A+' Grade NAAC Accredited)

Guidelines to implement the MOOCs/ SWAYAM online courses in the Institute

In pursuance to the Gazette Notification No. 295 dated 19th July 2016 of University Grants Commission notifying the "UGC (Credit Framework for Online Learning Courses through SWAYAM) Regulations, 2016" for adoption of MOOCs (Massive Open Online Courses) through SWAYAM (Study Web of Active Learning by Young and Aspiring Mind) platform, Kurukshetra University, Kurukshetra has framed the following guidelines for implementation of Online courses in all the Institute:

1. These guidelines shall be called the "Guidelines to implement the SWAYAM/MOOCs/ other authorized online courses (OAOC), in the Institute".

2. These guidelines shall apply to the transfer of credits of such students who are enrolled as students in any of the department of the Institute.

3. These shall come into force from the date of approval of the Academic Council of the Institute/University.

4. The procedure for adopting Online Learning Courses:

4.1 The Principal Investigator (PI), a Subject Matter Expert entrusted by the National MOOCs Coordinator (NMC) or equivalent agency will offer the online learning courses for the forthcoming Semester through an institution (called Host Institution). The courses will be made available through the online portal twice a year (for odd semester and even semester).

4.2 Once the list of online learning courses to be offered in the forthcoming Semester is available on SWAYAM/NPTEL (National Programme on Technology Enhanced Learning)/ Authorized Portal Offering Online Courses (APOOC), Head/Faculty Incharge of the Department shall notify a list of courses from SWAYAM/NPTEL portal/APOOC keeping in view the academic requirements of students, subject to the approval of Academic Council of the Institute/University.

4.3 The Head/Faculty Incharge of the Department will recommend the courses of SWAYAM/NPTEL/OAOC to the Authorities of the Institute/University, if:

4.3.1 There is non-availability of suitable teaching staff or running a course in the department.

4.3.2 The facilities for offering the elective papers (courses), sought for by the students are not on offer in the department, but are available on the SWAYAM/NPTEL/APOOC platform.

4.3.3 The courses offered on SWAYAM/NPTEL/APOOC would supplement the teaching-learning process in the department.

4.4 The Head/Faculty Incharge of the Department shall ensure that the physical facilities like laboratories, computer facilities, library etc., as essential for pursuing the courses, are available inadequate measure.

4.5 Every student is required to register for and complete (minimum) one course out of those offered by the department and pay for the certification registration fee on the online platform of the portal meant for it.

4.6 The constituent college/school must designate an Online Course Coordinator (OCC) in the respective department along with a relevant course faculty (for each SWAYAM/NPTEL/OAOC course) who will be responsible to guide the students throughout the course and to facilitate/conduct the Lab/Practical Sessions/examinations. The OCC will monitor compliance of these guidelines, keeping the Head/Faculty Incharge apprised of the progress, time to time, and also collect relevant documents from each online course faculty for record purposes, at the end of a course.

5. Evaluation and Certification of SWAYAM/MOOCs/Online courses:

5.1 The Host Institution and the PI shall be responsible for evaluating the students registered for the MOOCs course launched by him/her.

5.2 The evaluation done by the Host Institution shall be based on predefined norms and parameters and shall be on a comprehensive evaluation throughout the length and breadth of course based on specified instruments like discussions, forums, quizzes, assignments, sessional examinations and final examination.

5.3 The examination for certification may be in online mode or a pen & paper mode as decided by PI and Host Institution. This shall be announced by the PI/Host Institution in the overview of the Course at the time it is offered.

5.4 In case, a pen and paper final examination is to be conducted, the same shall be offered through any college/school volunteering to conduct the same. The decision in this respect will be of the PI and the Host Institution.

5.5 After conduct of the examination and completion of the evaluation, the PI through the Host Institution shall award marks/grade as per the evaluation scheme announced.

5.6 The final marks/grade shall be communicated to the students as well as the department/Institute/University generally within four weeks from the date of completion of the final examination.

5.7 The concerned department shall forward the marks/grade to the Office of the Controller of Examinations to incorporate into mark sheet/grade card of the students.

5.8 The Office of the Controller of Examinations shall give the equivalent credit weightage to the students for the credits earned through online learning courses (not

more than 20% of courses in any semester). In case the completed course has been selected by the student towards the grant of Minor degree/Hons. in a particular Emerging Area offered by the Institute, it should clearly be specified by the student and verified and communicated to the Office of the Controller of Examinations by the Heads/ Faculty Incharge.

5.9 These marks/grade will be reflected on the student's mark sheet/grade card and may be counted for final award of the degree by the University.

5.10 The courses in which Lab/Practical Component is involved, the concerned department shall evaluate the students for the practical/lab component and the marks/grade obtained by the students be forwarded to the Office of the Controller of Examinations for incorporation into marks sheet/grade card.

5.11 The PI through its Host Institution will send to Department/Institute/University Certificate(s) in respect of all those students who would have successfully completed the MOOCs course. Heads/Faculty Incharge of the concerned department will ensure the award of these certificates to the concerned students.