CHOICE BASED CREDIT SYSTEM EVALUATION SCHEME

AND
COURSE OF STUDY

(According to AICTE Model Curriculum2023 as per NEP 2020)

B. TECH. Minor Degree

IN

ROBOTICS

Eligible Branches:

All branches

FACULTY OF ENGINEERING AND TECHNOLOGY

GURUKULA KANGRI (DEEMED TO UNIVERISTY), HARIDWAR

[Effective from 2024-25]

Bachelor of Technology

<u>MINOR DEGREE IN ROBOTICS</u>

To enhance employability skills and impart deep knowledge in emerging areas that are usually not covered in the undergraduate degree credit framework, AICTE has come up with the concept of a 'Minor Degree' in emerging areas. The concept of a Minor Degree in discussed in the Approval Process Handbook (APH). A minor degree will carry 18 to 20 credits in addition to the credits essential for obtaining the Undergraduate Degree in Major Discipline (i.e. 160 credits for regular students and 120 credits for lateral entry students).

The **Bachelor of Technology (B.Tech.)** with a Minor program focuses on the fundamental principles of multiple Engineering disciplines, critical and analytical thinking and the ability to develop a distinctive approach to interdisciplinary problems.

OBJECTIVES

The key objectives of offering B.Tech. with Minor programs are:

- To enable students to pursue an allied academic interest in contemporary areas
- To expand the domain knowledge of the students in one of the other branches of engineering.
- To provide an academic mechanism for fulfilling the multidisciplinary demands of industries.
- To provide an opportunity to students to explore and persue different emerging fields of study in addition to their Major program.
- To increase the employability of undergraduate students keeping in view better opportunities in interdisciplinary areas of engineering & technology.
- To enable students, build knowledge in the areas that are identified as emerging technologies/thrust areas of Engineering.
- Provides an opportunity for students to become entrepreneurs and leaders by taking a business/ management minor.
- Provides an opportunity to Applicants to pursue higher studies in an interdisciplinary/ emerging field of study.
- To increase the overall scope to the undergraduate degrees.

Minor Courses Syllabus

The Board of Studies (BoS) of the University shall recommend the ONLINE courses for minor degrees. The list of the courses that are included in each track will form a syllabus for minor degree programs. These courses are to be offered between the fourth to eighth semesters for all branches. The eligible list of programs for various minor baskets shall be published by the University.

Short Title, Applicability, and Commencement:

- These Regulations shall be called "GK(DU) Regulations Governing the Award of B.Tech program with Minor Degree.
- These Regulations shall apply to all B.E/B.Tech. Programs are being conducted by the University.
- These Regulations shall come into force from the date of their notification by the University.

Definitions:

- In these Regulations, unless the context requires otherwise or it is specifically defined:
- **'AICTE'** means the All-India Council for Technical Education and was established by an Act of Parliament in 1987.
- **'Coursework"** means the Courses prescribed for the Minor program, which the candidate shall complete in the specified period for the Degree award.
- **'E-resources'** means learning material saved electronically in online storage platforms/devices for use anywhere/any time accessed online or after being downloaded from the relevant sources.
- '**Minor'** means a recognition award to an undergraduate (UG) student on earning the specified extra credits after satisfying the relevant Degree award conditions.

Eligibility Criteria for Registration:

- Registration for a Minor degree shall start from the **fourth** semester of the B.Tech. program.
- A student can opt for only one minor program along with major (degree) program. No student shall be permitted to register for both honors as well as minors.
- A student may choose to pursue a B.Tech. degree with a minor program if, at the time of registration, he has permissible backlogs up to the third semester under the regulations governing the B.Tech. degree and provided that the student's cumulative grade point average (CGPA) after the third semester does not fall below 5.0
- Before receiving a major degree, students who enroll in a minor degree program must successfully complete (pass) all prerequisite courses. Even if he fails in the courses chosen for minor degree programs, they must be finished (passed) before a major degree is granted.
- The minimum CGPA required to maintain up to 3rd semester of the major (core) degree program is ≥ 5.0.
- Prior approval of the mentor, Head of the Department, and Dean of Faulty, for the enrolment into the Minor program, before commencement is mandatory

Registration Procedure:

- Any student meeting the eligibility criteria specified above and intending to register for the Minor Degree shall apply to the University through the respective Head of the Department in the prescribed form/online form along

- with the prescribed application fees within 15 Working days after notification by the University.
- There shall be no limit on the intake of students for registration for the minor qualification. All the applicants fulfilling the eligibility criteria can register.
- The department must give notice of registration for a minor degree program; otherwise, students must register for a minor degree program within the next 15 working days following the announcement of the third-semester results on the university website/ notice boards.
- The students shall pay a one-time non-refundable registration fee as prescribed by the University to confirm the registration.
- Fees for late registration may be imposed as per the university norms.

Instructions:

- The choice to opt/take a minor program is purely the choice of the students.
- For B.Tech. with a Minor, a student needs to earn an additional 18-20 credits (over and above the required 160 credits for the B. Tech program). The list of ONLINE courses of each Minor program, the respective credits weightage, and the semester-wises break-up of the courses are published by the University. All these 18-20 credits need to be completed from the IV semester to the VIII semester only.
- These 18-20 credits are to be earned from the additional recommended courses offered through ONLINE mode.
- After registering for the Minor program, if a student is unable to earn all the required 18-20 credits in a specified duration, he/she shall not be awarded a Minor degree. However, if the student earns all the required 160 credits of B.Tech., he will be awarded only B.Tech degree in the concerned branch.
- Minor must be completed simultaneously with a major degree program. A student cannot earn the Minor after he has already earned a bachelor's degree.
- The student can choose only one Minor program along with his/her basic engineering degree. A student who chooses an Honours program is not eligible to choose a Minor program and vice-versa.
- There is no transfer of credits from Minor program courses to regular B.Tech. Degree course and vice-versa. No student is permitted to switch from Honour's program to Minor's program and vice-versa.
- A student can graduate with a Minor if he fulfills the requirements for his regular B.E./B.Tech program as well as fulfills the requirements for the Minor program.
- The student shall be given a choice of withdrawing all the courses registered and/or the credits earned for the Minor program at any time: in that case, the student will be awarded only B.Tech., degree in the concerned branch on earning the required credits of 160.
- The department shall maintain a record of students registered and pursuing their Minor program, minor program-wise, and parent branch-wise. The same report needs to be sent to the University once the enrolment process is complete.

- All the students who complete the course as prescribed above and submit their certificates in time before the closure of the UG (8th Semester) as per the academic calendar shall be eligible for the "Minors" qualification.
- The CGPA and/or Class awarded to the students shall be only based on students' performance in the various semester-level examinations conducted proctored manner.
- The University shall have the powers to issue clarifications to remove any doubt difficulty or anomaly which may arise during the implementation of the provisions of these Regulations.

Bachelor of Technology

MINOR DEGREE IN ROBOTICS

<u>COURSE STRUCTURE</u>

S.NO.	SEMESTER	COURSE CODE	SUBJECT	Period per week			EVALUATION SCHEME				Credit	Subject TOTAL
							SESSIONAL EXAM.			EXAM. ESE		
				L	T	P	CT	TA	TOTAL			
			THEORY SUBJECTS									
1	IV	BME-M401	Introduction to Robotics	3	1	0	20	10	30	70	4	100
2	V	BME-M501	Kinematics & Dynamics of Manipulator	3	1	0	20	10	30	70	4	100
3	VI	BET-M601	Microprocessor & Embedded System	3	1	0	20	10	30	70	4	100
4	VII	BET-M701	Control of Robotics	3	0	0	20	10	30	70	3	100
5	VIII	BME-M860	Project in ROBOTICS	1	0	6	20	10	60	140	4	200
			TOTAL	13	3	6	100	50	180	420	19	600

L-Lecture; **T**-Tutorial; **P**-Practical; **CT**-Cumulative Test; **TA**- Teacher Assessment; **ESE**–End Semester Examination;

Grading & Grade Points: O(Outstanding**)= 10; A⁺(**Excellent**)= 9; A(**Very Good**)= 8; B⁺(**Good**)= 7; B(**Above Average**)= 6; C(**Average**)= 5; P(**Pass**)= 4; F(**Fail**)= 0; Ab(**Absent**)= 0**

Department of Mechanical Engineering, and

Faculty of Engineering & Technology, GK(DU), Haridwar   *Department of Electronics & Communication Engineering*