Minor and Dual Major Structure for CSE
01/04/2024

Minor in CSE/AI

Students admitted at IIT Gandhinagar in a discipline (X) other than Computer Science and Engineering (CSE)/Artificial Intelligence (AI), can opt for **additional learning** and pursue a Minor in CSE/AI. This is possible by successfully completing **20 additional credits of courses (CSE/AI)** *on top of the regular requirements* of earning a B.Tech. in their base programme (X).

- Students admitted from AY 2022-23, two open electives from the *base programme*, if it qualifies, may be counted in the 20 additional credits which are needed for a Minor for this student group.

- Students admitted before AY 2022-23, in addition to the requirements of the *base level BTech degree*, must complete 20 credits of courses from CSE/AI which enhances their core competence in CSE/AI. One of the open elective courses of the base programme, if it qualifies, may be counted towards Minor in which case the requirement of open electives will reduce to 12 credits.

(Applicable for students admitted from AY 2022-23)

Minor in Computer Science and Engineering (CSE)

The courses specified by the Department of CSE for a minor in the CSE discipline are:

- **ES 242: Data Structures & Algorithms I** (4 credits) will be *mandatory* for a minor in CSE except for students who are pursuing a BTech with an AI Major. For students who are pursuing a BTech in AI Major, ES 242 is a mandatory requirement for their AI Major.
- ***Additionally, at least two core*** courses of CSE from the list given below (which are not a requirement of the base programme) must be taken.

Course Code	Current Title of the Course
ES 214	Discrete Mathematics
ES 204	Digital Systems
ES 215	Computer Organization & Architecture
CS 330	Operating Systems
CS 201	Theory of Computing

CS 202	CSE Software Tools and Techniques
CS 331	Computer Networks
CS 329	Foundations of AI: Multiagent Systems

- ***Other two courses can be any*** from Any CSXXX, other courses prescribed by the Department of CSE, including the ones above.
- ***At most one CS 299/399/499 course*** can be counted towards the requirement of a minor in CSE. Students are usually expected to take project courses *after completing Data Structures & Algorithms I and at least one more CSXXX course*.

(Applicable for students admitted from AY 2023-24)

Minor in Artificial Intelligence (AI)

The courses specified by the Department of CSE for a minor in AI are:

- **CS 303: Mathematical Foundations for AI** (4 credits) will be *mandatory* for a minor in AI.
- ***Additionally, at least two*** core courses of AI from the list given below, which are not a requirement of the base programme must be taken.

Course Code	Current Title of the Course
ES 204	Digital Systems
ES 242	Data Structures & Algorithms I
ES 244	Signals, Systems & Random Processes
ES 245	Control Systems
ES 335	Machine Learning
CS 201	Theory of Computing
CS 328	Introduction to Data Science
CS 329	Foundations for AI: Multiagent Systems
CS 203	AI Software Tools & Techniques
ES 215	Computer Organization & Architecture

- ***Other two courses can be any*** from discipline-specific electives of AI/selected

other courses, including the ones above.

- ***At most one CS 299/399/499 course*** can be counted towards the requirement of a minor in AI. Students are usually expected to take project courses *after completing at least two AI courses*.

Dual Major in CSE/AI

This provision is to enable students enrolled in the B.Tech. programme (other than CSE/AI) at IIT Gandhinagar to complete a second major in CSE/AI.

Eligibility and Approval Process

- B. Tech. students who *joined IIT Gandhinagar in 2014 or later* may *apply* for a second major *any time after completion of three semesters*.
- The students will *submit an application with recommendations of both disciplines* to the Dean, Academic Affairs for final approval by the Chairman, Senate.
- The number of students approved for second major in a discipline may not exceed by 10 seats or 20% of the sanctioned strength of that discipline whichever is higher.
- Permission for dual major shall be in the order of merit determined by the students' CPI. Only those students with CPI greater than or equal to 6.50 and without fail grade (F or E) in any non-zero credit course will be eligible to apply. The CPI comparison will be within a batch.
- This provision is extended to the *students who entered B.Tech. in 2013* with a *one-time exception* to *apply for it before the end of sixth semester*.

Graduation Requirements *(applicable for students admitted before AY 2022-23)*

a. Students enrolled in the dual major programme will have to complete all the core courses as defined by CSE/AI discipline in addition to the minimum credit requirements of their primary discipline.
b. Discipline-specific core courses that are common to major in the two disciplines need not be repeated.
c. The scheduling of courses will be up to the students and not the responsibility of the institute.
d. The requirement of open elective courses will be reduced by 4 credits in case of double major.
e. The credit requirements must be completed in a maximum of 12 semesters.
f. The criteria for Guided Progress Scheme and Termination of Programme will be the same as prescribed for the students pursuing a single major. The provision of Pass/Fail option will also remain unchanged (without additional benefits).
g. All other norms for the B.Tech. programme will be applicable.

Graduation Requirements *(applicable for students admitted from AY 2022-23)*

a. Students enrolled in the dual major programme will have to complete all the core courses as defined by CSE/AI in addition to the minimum credit requirements of their primary discipline.
b. Discipline-specific core courses that are common to major in the two disciplines need not be repeated.
c. Notwithstanding points a. and b. above, students must complete at least 28 credits of courses from the CSE/AI discipline, in addition to core courses common to both the disciplines. This requirement is in addition to the credit requirements for a major in the primary discipline.
d. The scheduling of courses will be up to the students and not the responsibility of the institute.
e. The requirement of open elective courses will be reduced by 4 credits in case of double major.
f. The credit requirements must be completed in a maximum of 12 semesters.
g. The criteria for Guided Progress Scheme and Termination of Programme will be the same as prescribed for the students pursuing a single major. The provision of Pass/Fail option will also remain unchanged (without additional benefits).
h. All other norms for the B.Tech. programme will be applicable.

For example, consider the case where 42 credits of core courses are prescribed for a major in CSE/AI. A student who opts for dual major in CSE/AI with 20 credits of common core courses with the primary discipline, will have to register for 28 credits of courses from the CSE/AI discipline in addition to the common core courses of 20 credits and credit requirements for major in the primary discipline. Please note that core courses of the CSE/AI discipline cannot be counted towards the elective/open elective requirements for major in the primary discipline.

Award of Degree

The student will be awarded B.Tech. degree mentioning both majors after successfully completing all the requirements. The name of admitting discipline will be mentioned first and the discipline of second major (CSE/AI) will follow.

Exit Options

The student may request to opt out of the dual major programme at any point during the programme after giving valid reasons, and if the request is approved, the student will be treated as in the B.Tech. programme with a major in parent discipline.