# POST GRADUATE PROGRAMS CURRICULA AND SYLLABI

## (Including Policies and Procedures)

## M TECH AND M CA

Attested True Copy

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श्रद्धावान् लभते ज्ञानम्

## AMRITA VISHWA VIDYAPEETHAM
## UNIVERSITY
### ESTABLISHED U/S. 3 OF UGC ACT, 1956

AMRITAPURI, BANGALORE, COIMBATORE, KOCHI, MYSORE

## 2010 and 2011 Admissions

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# I. POLICIES AND PROCEDURES

With the aim of developing a strong postgraduate and research culture, Amrita Vishwa Vidyapeetham offers postgraduate programs in Engineering, Medicine, Sciences, Business Management etc. This booklet contains the curricula and syllabi for all the postgraduate programs in Engineering together with the relevant Policies and Procedures

## 1. Policies

### M. Tech

1. The duration of the M.Tech. program shall normally be four semesters (2 years).
2. The M.Tech. Program will be known as: M.Tech. in <Name of specialization>. For example, if the M.Tech is offered with specialization in Embedded Systems, it will be called M.Tech in Embedded Systems. There will be no mention of the name of the Department(s) offering the programme.
3. The coursework requirement shall be 50 to 52 credits at post-graduate level, and 14 credits of project work totalling 64 to 66 credits for the award of the M.Tech. degree of the University.
4. The medium of instruction shall be English.

### M.C.A

1. The duration of the MCA program shall normally be six semesters (3 years).
2. The coursework requirement shall be 116 credits at post-graduate level including 15 credits of project work in the sixth semester.
3. The medium of instruction shall be English.

## 2. Structure of M.Tech/ MCA Programs

### 2.1 General Structure

M.Tech./ MCA programs are structured under credit based continuous assessment evaluation following semester pattern. Each program will have curricula and syllabi which will be updated necessarily once in two years based on the recommendations of the Board of Studies for the programs concerned. The Board of Studies will consist of experts from other leading academic institutions and R & D establishments in addition to the senior faculty from the University. However, the faculty can offer electives of current interest, in between also, with the approval of CPGP.

### 2.2 Credit Requirements

These are course work intensive programs generally and for MTech, it is three semesters of course work ending with a dissertation in the fourth semester. The coursework requirement shall be 50 to 52 credits at post-graduate level, and 14 credits of project / dissertation work totalling to 64 to 66 credits for the award of the M.Tech. Degree of the University. The credits are generally assigned to the courses based on the pattern given under:

- One credit for each lecture period per week
- One credit for each tutorial period per week
- One credit for each laboratory/ practical course of three periods per week.

All the courses shall be University approved post-graduate courses, and the credits shall be earned as per the following category guidelines (specialization -wise details are given in the respective Syllabi)

- Core Courses: 35 to 40 credits

- Project / Dissertation Work: 14 credits (Minor Project – 4 credits + Dissertation – 10 credits)
- Remaining credits from Electives

In case of MCA, the requirement is 116 credits at post graduate level including fifteen credits of project work.

## 2.3 Faculty Advisor

Upon admission, every M.Tech./ MCA student will be assigned a faculty advisor by the Chairman of the Department concerned. The faculty advisors will advise the students in all academic activities including registration, selection of electives, choosing projects etc. They will also counsel them wherever/ whenever required and advise them in non-academic matters also when needed.

## 2.4 Course Committee

For a given course, all the campuses will be governed by the same curricula and syllabi. When the same courses are offered in more than one campus, there will be a course committee for each course offered. The committee will consist of mentors, one from each campus nominated by the Chairperson of the Department in that Campus and a convener will be chosen from among them. In addition, there will be two student representatives in this Committee, who will be invited for all meetings except those dealing with question papers and other confidential matters. The course committee shall meet in the beginning of the semester to finalise the teaching program as well as evaluation pattern and, at the mid of the semester to finalise the question papers and the keys for the end semester examination of the particular course.

## 2.5 Registration

It is necessary that every student registers for each and every course (including project / dissertation work) within the stipulated time by filling up the required form and getting it approved by the faculty concerned. Any violation may lead to non-acceptance of the course registration.

A student is permitted to register/ enroll for courses if and only if he/ she has:
- Paid all fees and has no dues to the University
- Has maintained the progress as required by the University
- Has completed pre-requisite courses, if prescribed
- Has no disciplinary action pending against him/her

Every student will be given a copy of the booklet listing all the M.Tech and MCA courses (together with syllabus, credits etc) offered. The students doing their Master's programme in one specialization can take courses offered in another specialization / department, with prior approval of the mentor and chairman concerned.

Except for the first semester, registration for a given semester shall be done during a week specified before the end semester examination of the previous semester. The consent of the faculty advisor and the course instructor are necessary for registration.

## 2.6 Evaluation

In theory courses (taught primarily in the lecture mode), the continuous assessment (sessionals) will be for 50% and end semester(final) examination for 50%, making it to 100%. For the continuous assessment, there will be two tests (dates will be given by the Controller of Examination) and a minimum of two assignments. The faculty can give more assignments, seminars, tutorials etc. In the case of laboratory courses and practicals, the weights for continuous assessment and end semester examination shall be 70:30. The weights for the components of continuous assessment will be

decided by the course committee in the beginning of the course itself. It is mandatory that the students appear for the end semester examination for the completion of the course. The pass minimum shall be 40% marks in all the subjects. In addition, the students should get a separate minimum of 30% marks each in the end semester examination as well as from the sessionals. It is necessary the students are informed of these in the beginning itself.

## 2.7 Failures

The failed students can appear for the supplementary examination(s). In addition, those students who could not appear for the end semester examination due to illness, or reasons beyond their control will be also permitted to appear for the supplementary examination(s). The students who have passed the examination are not permitted to appear for the supplementary examination for improving their grades. The grade FA once awarded stays in record and it is not deleted even after he/she completes the course successfully later. If the student fails in the supplementary examination also, he/she has to re-register for the course and satisfy all the requirements expected of fresh registrants. Such of those who fail due to lack of attendance (FA grade) will not be allowed to appear for the supplementary examination and they have to re-register for the course. In the case of core courses, it is mandatory to successfully complete the same core course. However, in the case of electives, if the student fails in the supplementary examination and the particular course is not offered during the program period (of two years), the CPGP may approve an equivalent course, on the recommendation of the advisor and the Dept Chairman.

In the exceptional case of the students not in a position to complete the requirements within two years, they have to extend their stay by one or two semesters as the case may be, pay the fees like any other student, once again register for the course(s) and successfully complete as per the normal requirements.

A student can not have more than two courses as arrears for moving from one semester to the next higher semester (refer to 4.1 also).

## 2.8 Dissertation

Every M.Tech. student is required to register for 4 credits of minor project along with other courses during the third semester and, 10 credits of dissertation during the fourth semester after completing all the course requirements, under a faculty member, within or outside the Department, and that particular faculty member will be referred to as the student's M.Tech. Advisor. The dissertation can be a logical continuation of the minor project.

In order to earn the credits for the dissertation, the students are strongly encouraged to work full-time as an intern in a project hosted at outside industry or Institution of calibre, in which case, the student is required to have an external M.Tech. Co-Advisor. It is necessary that a small write up about the dissertation and a statement that it is of M.Tech. level dissertation at the University is submitted by the M.Tech. advisor to the CPGP through the Chairman for approval. The other administrative requirements are also to be satisfied to get the approval of the Dean/Principal for carrying out the dissertation outside Amrita.

Towards the end of completing the dissertation work, the M. Tech. student is required to submit a Dissertation Report, documenting all the results, including system design, implementation, theory, experiments, and performance evaluation, as applicable. The dissertation report is submitted to the M.Tech. Advisor. If applicable, an evaluation (qualitative or quantitative) by the M.Tech. Co-Advisor will be also taken into account by the M.Tech. Advisor.

The CPGP, may invite external experts to help the final evaluation of the students' dissertations. The CPGP will assign each M.Tech. Student's report to a Committee (which is usually headed by the Chairman of that Department and consists of the M.Tech. Advisor(s) and senior faculty of the Department). In case the M.Tech. advisor and the Chairman are same, the Vice Chairman of the Department will head the Committee. There are two parts to the evaluation. In the first part, which is open to public, all M.Tech. students are required to briefly present their work. In the second part, which is closed-door (with just the Committee members in attendance), a thorough discussion about the dissertation may be carried out, at the conclusion of which, for each Student, the Committee will assign a numerical score out of a maximum of hundred. After completing the evaluation of all the M.Tech. students in that specialization, all the M.Tech. Advisors in that specialization and the Chairman meet and assign every student a letter grade. If the dissertation is not satisfactory, the student will be asked to continue the dissertation and appear for the assessment later and an "I" grade will be given.

## 3. Abbreviations used in this Booklet

### Course Classification

FC - Foundation Core
SC - Subject Core
E - Electives
P/F - Pass/Fail

## Course Codes

CN - Computational Engineering & Networking
RW - Remote Sensing and Wireless Sensor Networks
CV - Computer Vision and Image Processing
VL - VLSI Design
BM - Biomedical Engineering
PE - Power Electronics
ES - Embedded Systems
CY - Cyber Security
ED - Engineering Design
ID - Integrated Design and Manufacturing
NT - Nano Technology
WN - Wireless Networks and Applications
CS - Computer Science and Engineering
CL - Chemical Engineering
CA - Computer Applications
HU - Humanities
MA - Mathematics
SS - Sciences

## 4. Grading

### 4.1 Award of Grades

Based on the performance in each course, a student is awarded at the end of the semester a letter grade in each of the courses registered. The letter grades, the corresponding grade points and the ratings are as follows:

| Letter Grade | Points | Ratings |
|---|---|---|
| A+ | 10 | Outstanding |
| A | 9 | Excellant |
| B+ | 8 | Very Good |
| B | 7 | Good |
| C+ | 6 | Above Average |
| C | 5 | Average |
| D | 4 | Marginal |
| F | 0 | Failure |
| FA | 0 | Failed due to lack of attendance |
| I | 0 | Incomplete |
| W | - | Withheld |

**Note:**

1. "FA" grade once awarded stays in the record of the student and is not deleted even after he/she completes the course successfully later.
2. The "I" grade will be subsequently changed into an appropriate grade when the student passes the supplementary examination.
3. A+ shall be given only for exceptionally good performance
4. The minimum required for pass for a given subject is D, but the semester average should be atleast 5.0
5. In case a candidate obtains D and above in a given semester, but fails to obtain the average of 5.0 in the semester, all the subjects with D grades will be treated as failures and the candidate shall appear for the supplementary examination for these subjects. In case the candidate fails to obtain the required SGPA of 5.0 even after the supplementary

examination, the candidate has to re-register the courses wherein the grades obtained are D and failures.

6. This facility will be available only for the above stated cases. There is no provision for the improvement of grades for the students who have passed the examination.
7. In case of students obtaining F grade, they will be allowed to appear for the supplementary examination only for the subjects with F grade.
8. In the supplementary examination (be it Note 5 or 7), if they fail in more than two subjects or fail to obtain an average of 5.0 and above as the term average, they will not be allowed to proceed to the next higher semester.

## 4.2 Semester Grade Point Average (SGPA)

On completion of a semester, each student is assigned Semester Grade Point Average (SGPA) which is computed as below for all courses registered by the student during that semester.

$$\text{Semester Grade Point Average} = \frac{\Sigma(C_i \times Gp_i)}{\Sigma C_i}$$

where $C_i$ is the number of credits for $i^{th}$ course in that semester and $Gp_i$ is the grade points earned by the student for that course.

## 4.3 Cumulative Grade Point Average (CGPA)

The overall performance of a student at any stage of the M.Tech. program is evaluated by the Cumulative Grade Point Average (CGPA) upto that point of time.

$$\text{Cumulative Grade Point Average} = \frac{\Sigma(C_i \times Gp_i)}{\Sigma C_i}$$

where $C_i$ is the number of credits for $i^{th}$ course in any semester

and $Gp_i$ is the grade points earned by the student for that course. The summation is over all the courses registered by the student and evaluated during all the semesters upto that point of time including the failed courses. The CGPA is rounded off to two decimals. The ranking of the students in a batch at any intermediate or final stage is based on CGPA.

## 5. Revaluation of Answer Papers

When the semester results are published, in case any student feels aggrieved, he/she can request for revaluation of answer scripts of the end semester examination. For this purpose, the student has to submit a request in the prescribed form to the Controller of Examination within three working days from the publication of results through the Chairman of the Department. The answer paper will be shown to the candidate in the presence of the faculty who valued the answer script and the Chairman. When the revaluation is completed, the results will be published. If the revaluation leads to a better grade, the revised grade will be awarded to the student. Revaluation will be allowed only for theory based courses.

## 6. Duration, Appeals and Amendments

### 6.1 Duration

The normal period of completion of the M.Tech. program is 2 years; at most an extension of upto one more year may be permitted. But for exceptional cases, it is not anticipated that students will be able to complete all of the M.Tech. Degree requirements in less than 2 years. In the case of MCA, the normal period of completion is three years; at most an extension of upto one more year may be permitted.

### 6.2 Appeals and Amendments

An M.Tech./ M C A student may petition to the CPGP, for a waiver/ substitution of any of the M.Tech./M C A Degree requirements. Escalation steps for such petitions consist of forwarding to the Vice Chancellor, whose decision will be final and binding.

## 7. Award of Degree

### 7.1 Distinction

In order to get the M.Tech. / M C A Degree with Distinction, the candidate has:

To pass all the subjects in the first attempt within the specified period of two/ three years obtaining a CGPA of 8.5 and above.

OR

To pass all the subjects in the first attempt obtaining a CGPA of 8.5 and above completing the program within three / four years (up to one year more) provided officially permitted to break the course.

OR

To pass all the subjects in the first attempt obtaining a CGPA of 8.5 and above and complete the project work before the end of the fifth / seventh semester (up to one semester extension) provided the extension is officially permitted by the CPGP due to administrative reasons.

### 7.2 First Class

To pass all the subjects in the first attempt within the specified period of two/ three years obtaining a CGPA between 7.00 and 8.49

OR

To pass all the subjects obtaining a CGPA of 8.5 and above taking one semester extra (due to failures etc.)

OR

Asked to redo the project work within one semester extra and obtains a CGPA of 8.5 and above.

## 7.3 Pass Class

Such of those students who are not covered under 7.1/ 7.2 will be awarded the degree without any class or distinction.

## 8. Attendance

1. Leave shall be availed by students only under unavoidable circumstances. It is mandatory that students apply in the prescribed form before proceeding on leave. Leave letter recommended by the class advisor shall be submitted to the Chairman of the Department who will normally grant the leave. Unauthorized absence will be treated as breach of discipline. Request for leave for more than three consecutive days on medical ground must be supported by a proper medical certificate. In non-medical cases, requests for leave for more than three consecutive days must be countersigned by the parent/ guardian. Leave granted will not be counted as attendance.

2. Students going on official duties such as representing the School for sports and cultural activities, or presenting papers in seminars will be eligible for "duty leave" on the recommendation by faculty advisor and Chairman of the Department. Duty leave will be counted as equivalent to attendance for administrative purposes limited to five working days per semester, provided the information is sent to all the faculty concerned at least one week in advance.

3. Attendance of the students will be marked by the teacher during every period of a course.

4. Finalization of attendance for every course shall be done three working days before the last instruction day of the semester. Any ent failing to secure a minimum of 90% attendance in a course not be eligible to appear for the end semester examination in course. The names of students not eligible to appear for the mination will be published.

5. If the attendance of a student falls short of 90% in any course due to continuous absence caused by accident, prolonged illness, or unforeseen circumstances, such case may be considered by the Dean concerned for condonation of absence based on the request of the student supported by required documents and recommendation of the class advisor and Chairman of the Department concerned. However, in such cases, the student must have duly applied for leave in time. The overall attendance of a student in such a case shall not fall below 75%. Condonation will be considered only in the case of those students who have proved themselves to be otherwise regular by attending at least 90% of the class during the semester excluding the period of long leave. Any student who has missed classes for genuine reasons (including on duty leave) will have to submit extra assignments etc (on holidays, late evenings etc) as prescribed by the faculty, to make up for the missed classes. The students will be eligible for the waiver / on duty leave if and only if they complete the extra work load to the satisfaction of the faculty concerned and, the faculty concerened certifies accordingly in the students final leave application.

Attested true copy

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