

**Syllabi & Scheme**  
**for M.Tech Course in**  
**EMBEDDED SYSTEMS**

**Of Calicut University**

**By**

**DOEACC CENTRE, CALICUT**

**Curriculum and Scheme of Examination for M.Tech. Programme in  
EMBEDDED SYSTEMS**

**(With Effect from the Academic Year 2004-2005)**

**FIRST SEMESTER**

Subject Code	Name of the Subject	Hours/Week		Internal Assessment Marks	University Examination	
		L/T	P/S		Hrs	Marks
<b>Core</b>						
ES 6101	System Design using Embedded Processors	3	0	50	3	100
ES 6131	System Design using Embedded Processors - Laboratory	0	4	100	-	-
ES 6102	Advanced Digital System Design	3	0	50	3	100
ES 6132	Advanced Digital System Design - Laboratory	0	4	100	-	-
ES 6103	Software Engineering	3	0	50	3	100
ES 6104	Seminar	-	3	50	-	-
<b>Elective (One Theory and its associated Laboratory subject to be selected from the Elective Subjects)</b>						
	Elective Theory	3	0	50	3	100
	Elective Laboratory	0	4	100	-	-
	Total	12	15	550	12	400
<b>Elective Subjects</b>						
ES 6105	Electronic System Design	3	0	50	3	100
ES 6135	Electronic System Design – Laboratory	0	4	100	-	-
ES 6106	Data Communications and Networking	3	0	50	3	100
ES 6136	Data Communications and Networking - Laboratory	0	4	100	-	-
ES 6107	Modern Control Systems Design	3	0	50	3	100
ES 6137	Modern Control Systems Design – Laboratory	0	4	100	-	-

**L/T – Lecture / Tutorial, P/S – Practical / Seminar**

**Note:**

1. Total number of Theory subjects – 4 (three core and one elective)
2. Total number of Laboratory subjects – 3 (two core and one elective)

## SECOND SEMESTER

Subject Code	Name of the Subject	Hours/Week		Internal Assessment Marks	* University Examination	
		L/T	P/S		Hrs	Marks
<b>Core</b>						
ES 6201	Design of Digital Signal Processing Systems	3	0	50	3	100
ES 6231	Design of Digital Signal Processing Systems - Laboratory	0	4	100	3	-
ES 6202	Embedded Software & RTOS	3	0	50	3	100
ES 6232	Embedded Software & RTOS – Laboratory	0	4	100	3	-
ES 6203	Product Design and Quality Management	3	0	50	3	100
<b>Elective (One Theory and the associated Laboratory subject to be selected from the Elective Subjects)</b>						
	Elective 1 (Theory)	3	0	50	3	100
	Elective 2 (Laboratory of Elective 1)	0	4	100	3	-
	Elective 3 (Theory)	3	0	50	3	100
	Total	15	12	550		500
<b>Elective Subjects</b>						
ES 6204	Electronic Instruments & Instrumentation Design	3	0	50	3	100
ES 6234	Electronic Instruments & Instrumentation Design - Laboratory	0	4	100	3	-
ES 6205	Wireless Communication Systems	3	0	50	3	100
ES 6206	Mixed Signal System Design	3	0	50	3	100
ES 6236	Mixed Signal System Design – Laboratory	0	4	100	3	-
ES 6207	Embedded Applications in Power Conversion	3	0	50	3	100
ES 6237	Embedded Applications in Power Conversion - Laboratory	0	4	100	3	-

**L/T – Lecture / Tutorial, P/S – Practical / Seminar**

**Note:**

1. Total number of Theory subjects – 5 (three core and two elective)
2. Total number of Laboratory subjects – 3 (two core and one elective)
3. \* The final University examination shall be conducted by DOEACC Centre, Calicut

<b>THIRD SEMESTER</b>						
<b>Subject Code</b>	<b>Name of subject</b>	<b>Hours/ week</b>		<b>Continuous Assessment Marks</b>	<b>End Semester Examination</b>	
		<b>L/T</b>	<b>P/S</b>		<b>Duration (Hrs)</b>	<b>Marks</b>
<b>ES 6299</b>	<b>Project work</b>	-	<b>40</b>	-	-	#

<b>FOURTH SEMESTER</b>						
<b>Subject Code</b>	<b>Name of subject</b>	<b>Hours/ week</b>		<b>Continuous Assessment Marks</b>	<b>End Semester Examination</b>	
		<b>L/T</b>	<b>P/S</b>		<b>Duration (Hrs)</b>	<b>Marks</b>
<b>ES 6299</b>	<b>Project work</b>	-	<b>40</b>	-	-	#

# Evaluation of the project will be conducted at the end of 3<sup>rd</sup> and 4<sup>th</sup> semesters.

## First Semester Scheme

### **1. Subject Distribution:**

The minimum number of theory and laboratory subjects for the first semester is four and three respectively. The theory and laboratory subjects are of 3 hours and 4 hours duration per week respectively. Seminar is of 3 hours duration per week. Each student has to undertake teaching assistance of 3 hours per week.

### **2. Evaluation:**

Each theory subject has an internal assessment and a University examination. Each laboratory subject has only internal assessment. All internal assessments shall be conducted at DOEACC Centre, Calicut.

### **3. Mark Distribution:**

Each theory subject carries 150 marks. Out of this, internal assessment carries 50 marks and final University examination carries 100 marks.

Each lab subject carries 100 marks and is awarded through internal assessment.

### **3.1 Internal Assessment**

#### **3.1.1. Theory Subjects**

The details of the Internal assessment for each theory subject are as given below.

1 <sup>st</sup> Test	15 Marks
2 <sup>nd</sup> Test	15 Marks
1 <sup>st</sup> Assignment	10 Marks
2 <sup>nd</sup> Assignment	10 Marks
<b>Total</b>	<b>50 Marks</b>

#### **3.1.2. Laboratory subjects**

The details of the Internal assessment for each laboratory subject are as given below.

1 <sup>st</sup> Test	20 Marks
2 <sup>nd</sup> Test	20 Marks
Laboratory Experiments	10 Marks
Final Test	50 Marks
<b>Total</b>	<b>100 Marks</b>

### **3.2 University Examination**

The final University examination for the first semester theory subjects shall be conducted by Calicut University. The marks of the University examination for each of the theory subjects shall be 100 Marks. The Calicut University shall set the question paper. The examination shall be conducted at the center and the answer paper shall be evaluated as per the norms of the Calicut University. In all matters concerned with the conduct of the University examination, the rules and regulations approved by the University of Calicut shall be followed.

#### **4. Pass Mark:**

A student undergoing the program is considered as passed for any subject only if he/she scores minimum marks of 40% in the University examination and an aggregate minimum marks of 50% for Internal and University examinations together for that subject.

## Second Semester Scheme

### **1. Subject Distribution:**

The minimum number of theory and laboratory subjects for the second semester is five and three respectively. The theory and laboratory subjects are of 3 hours and 4 hours duration per week respectively. Each student has to undertake teaching assistance of 3 hours per week.

### **2. Evaluation:**

All theory subjects have an internal assessment and a final University examination. Both shall be conducted at DOEACC Centre, Calicut. Each laboratory subject has only internal assessment. All internal assessments shall be conducted at DOEACC Centre, Calicut.

### **3. Mark Distribution:**

Each theory subject carries 150 marks. Out of this, internal assessment carries 50 marks and final University examination carries 100 marks.

Each lab subject carries 100 marks and is awarded through internal assessment.

### **3.1 Internal Assessment**

#### **3.1.1. Theory Subjects**

The details of the Internal assessment for each theory subject are as given below.

1 <sup>st</sup> Internal Test	15 Marks
2 <sup>nd</sup> Internal Test	15 Marks
1 <sup>st</sup> Assignment	10 Marks
2 <sup>nd</sup> Assignment	10 Marks
<b>Total</b>	<b>50 Marks</b>

#### **3.1.2. Laboratory subjects**

The details of the Internal assessment for each laboratory subject are as given below.

1 <sup>st</sup> Test	20 Marks
2 <sup>nd</sup> Test	20 Marks
Laboratory Experiments	10 Marks
Final Test	50 Marks
<b>Total</b>	<b>100 Marks</b>

### **3.2 University Examination**

The final University examination for the second semester theory subjects shall be conducted by DOEACC Centre, Calicut.

#### **4. Pass Mark:**

A student undergoing the program is considered as passed for any subject only if he/she scores minimum marks of 40% in the University examination and an aggregate minimum marks of 50% for Internal and University examinations together for that subject.

## **Project Work Scheme**

The project work shall be of the minimum duration stipulated by AICTE (presently two semesters). The nature of the project work shall be of real life Embedded Product design and development or Embedded System design and development. The problem may be selected from an appropriate Industry or Institution.

The candidate is expected to work under the guidance of a project guide (faculty from DOEACC Centre, Calicut) at least for a period of 10 full months. In case the project work is taken up in an external Industry/Institution, the project shall have two guides: one in the participating organization (Industry/Institution) who is the external guide and the other shall be one of the faculty members from DOEACC Centre, Calicut who is the internal guide. The dissertation should be submitted within two calendar years from the starting date of the third semester. Six copies of the dissertation have to be submitted to the M.Tech Embedded System Coordinator. These copies shall be distributed to the External examiner, Internal Examiner, Project guide (Faculty), DOEACC Centre Library, DOEACC Centre Department and Calicut University.

### **Evaluation of Project Work:**

The project evaluation committee shall be responsible for the project work evaluation. The Project evaluation committee will be consisting of chairman, an internal examiner and an external examiner. The chairman of the project evaluation committee shall be the Director or Director-in-charge of the DOEACC Centre, Calicut. The project guide (faculty from DOEACC Centre, Calicut) shall be the internal examiner. The external examiner shall be a technical expert in the concerned subject from any organization other than that of the project guide and is selected from the panel of experts submitted by the project guide. The project work shall be evaluated through presentations and viva voice. The grade shall be given to the students according to the level and quality of work and presentation/documentation.

### **Project Work Grade**

Percentage of Marks	Grade
85% and above	Excellent
75% and above, but below 85%	Very Good
60% and above, but below 75%	Good
50% and above, but below 60%	Satisfactory
Below 50%	Not accepted