



Course Title: ARM Architecture for Mobile communication

Course Code: ECE753

Credit Units: 4

Level: PG

L	T	P/ S	SW/F W	TOTAL CREDIT UNITS
3	1	0	0	4

Course Objectives: The objective of the paper is to facilitate the student with the understanding of embedded system design and ARM architecture in particular

Prerequisites: programming concepts embedded programming in C and C ++ & RTOS

Course contents/Syllabus:

	Weightage (%)
Module I Introduction to Embedded System Design, Embedded System Architecture, Embedded System model, an overview of Programming Languages and examples of their standards, Embedded Processor: ISA Architecture Models, Application-specific ISA models, FSMD model, JVM model, CISC & RISC model, Instruction – Level Parallelism ISA model, Von Neumann & Harvard Architectures	25%
Module II ARM Embedded System, ARM Processor Fundamentals: Registers, Pipeline, Exceptions, Interrupts and vector tables, ARM Processor family, ARM Instruction Set, Thumb Instruction Set	25%
Module III: Overview of C compiler and Optimization: Register allocation, Functions Calls, Pointer aliasing, Structure arrangement, Portability issues, writing and optimizing ARM assembly code	25%
Module IV:	25%

Interrupts and interrupt handling Scheme, firmware and Boot loader, Real-Time operating Systems: Context Switching, task tables and kernels, Time Slice, Scheduler algorithms: RMS, Deadline monotonic Scheduling; Priority Inversion, Tasks, Threads and process, Exceptions, Exception handling

Student Learning Outcomes:

- Understand the fundamental knowledge of mobile processor
- Design and conduct experiments, as well as to analyze different ARM processors
- Identify the issues of designing a processor for mobile communication
- Write efficient programs along with understanding the limitations and mechanisms of ARM processors

Pedagogy for Course Delivery:

The class will be taught using theory and case based method. Since this is programming course, students are given problems based on ARM processors. Current research paper based study of mobile architectures will also be done

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	Total
100%	NA	100%

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					End Term Examination
Components (Drop down)	Mid-Term Exam(CT)	S/V/Q	HA	Attendance(A)	
Weightage (%)	10%	8%	7%	5%	70%

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; A: Attendance

Text & References

Text:

- Embedded Systems Architecture by Tammy Overgaard; Elsevier Publisher; 2005
- ARM System Developer's Guide by A.N. Sloss, D. Symes and C. Wright; Elsevier Publisher; 2006
- Embedded System Design by Steve Heath, Elsevier Publisher; 2006
- Embedded Systems by Raj Kamal, TMH; 2006
- Embedded Microcomputer Systems, Thomson Publisher; 2005

