

# Syllabus for 2009

Standard C89/C99

Advance C programming

Microcontroller programming on C

Linux Device Driver programming on C

Networking programming on C

Application development using SDL and GTK

Linux Essential for C programmers



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# Advance C

1. **What's to remember :** Compiler, operating system, Micro processor, address bus , data bus
2. **C standards - C89/C99 ,** Keywords and Characters set, Memory Models
3. **Programming Environment:** Programming Development Tools, Shell, Shell Variables, Process, Standard include path and Library path, Editor: Text Editor - Vim, Graphical Editor - KDE
4. **Linux Installation & Configuration**
5. **Memory :** 16 bits process memory layout, 32 bits process memory layout ,Features of 16/32 ,its programming ,Segmentation, paging, user space, kernel space, text, data, heap, stack
6. **Data Types:** Data types, variables, constants, modifiers, qualifiers, format specifies
7. **Operators:** utility of all 45 operators, precedence and associativity
8. **Control Structure:** Decision Control structure( if...else), Selection Control structure( witch), Repetition control structure( for,while,do while), Jump control structure ( goto).
9. **Pointer:** Null pointer, segmentation fault, memory leak, core dump, dangling pointer.
10. **Memory Allocation -** static and dynamic allocation using variable and function
11. **Array:** Single dimensional array,Multi dimensional array, Dynamic array
12. **Function:** static and dynamic library, Function recursion.
13. **Storage Class:** File scoping , program scoping, block scoping, function scoping
14. **Preprocessor:** File inclusion, Macro expansion, Conditional compilation, Miscellaneous.
15. **Structure:** Data Encapsulation, Memory leak, Bit field
16. **Union:**

17. **FILE:** Reading external files, Creating new file types
18. **Command line argument:** command line, environment variables like TMP, PATH, LD\_LIBRARY, configuration file, about shell
19. **Data Structure:** Linked list - single, double and operations of linked list, stack as DS, Queue as DS.
20. **Miscellaneous:** Compression, Decompression, Reading External File format - BMP reading and Wav file reading
21. **Programming Development Tools for Linux programmer:** KDE, GDB, make, cscope, ldd, valgrind, strace, gcc, ps, pmap, objdump, ulimit, size, top
22. **Process, IPC, Signal and threads**
23. **Embedded programming:** Assembly, WinAVR, Microprocessor and Micro controller, Program to write in Microcontroller, BSD programmer, Making a Robot
24. **Network Programming:** Socket programming, Socket and data handling, Client and Server background, TCP/IP/UDP
25. **Device Driver:** User Space, kernel Space, Linux kernel compilation, Writing, compiling, debugging kernel module. Character, block and network Device Driver
26. **Program using ODBC**
27. **Graphics using SDL and GTK :** SDL Audio, SDL Video, SDL GUI Application and GTK

**Faculty : Susant K Rout**

**Duration : 2 Months (120 hours theory and unlimited Practical time)**

