<u>Proposal for a New Academic Course</u>

Notes: i) All fields, except the Preamble, are mandatory and must be completed with appropriate, complete responses. ii) The proposal should be submitted **both** in **hard copy** & in **electronic** (.pdf) form to

<u>sunanda@iitb.ac.in</u>   **or** rajnibhate@iitb.ac.in

Name of Academic Unit (Department /School/ Centre/ ID Group) : CSE

Preamble to the proposal (optional) :

Level : Undergraduate

Programme : B.Tech.

i	**Title** of the course	Kernel programming
ii	Credit Structure (**L-T-P-C**)	3-0-0-6
iii	**Type** of Course (Institute/ Departmental) + (Core/ Elective/ ...)	UG Elective
iv	Semester in which normally to be offered (**Autumn/Spring**)	Autumn
v	Whether **Full or Half Semester** Course	Full
vi	**Pre-requisite(s)**, if any (For the students) – *specify course number(s)*	CS347, CS377, CS213, CS296
vii	Course **Content** *	List of topics to be covered: - Kernel compilation and modules - System calls and in-line assembly - Memory addressing and page tables - Process management and scheduling - Interrupts and interrupt handlers - Kernel timers and synchronization - The virtual file system interface - Kernel tracing, probing and profiling tools The course structure: - text book/paper reading and reviews - exercises and assignments - a kernel modifications based project
viii	**Texts/References** **	Books: (i) Understanding the Linux Kernel, by Daniel P. Bovet, Marco Cesati, Third Edition, O'Reilly & Associates, 2006 (ii) Linux Kernel Development, Robert Love, Third Edition, Pearson Education, 2010 (iii) Kernel projects for Linux, Gary Nutt, Addison Wesley Longman Publishing Co., 2000

ix	Name(s) of **Instructor(s)** ***	Purushottam Kulkarni
x	Name(s) of **other Departments/ Academic Units to whom** the course is **relevant**	EE
xi	Is/Are there any course(s) in the same/ other academic unit(s) which is/ are **equivalent** to this course? If so, please give details.	No equivalent course.
xii	**Justification/ Need** for introducing the course	CS347+CS377 introduce several basics of Operating Systems. This elective is meant to be an advanced course as a follow up to CS347. Additionally, the course will be structured on a widely used operating system. The students will get a chance to reinforce concepts studied in the basic course, modify, test and evaluate modifications to a "real" operating system. A hands-on systems course is missing from the UG program and this course is aimed at filling that gap. The goal of this course is to offer an advanced version of the basic operating systems course in a hands-on manner. The course will primarily be structured around exercises and assignments. Each topic will be introduced before its corresponding hands-on component. The idea is to learn and explore a full-fledged operating system up-close and to use it for kernel-based modifications. Observing and manipulating a real operating system is a key feature of the course. The exercises, meant to get an inside view of the kernel, will lead up to a project that will have to be submitted as the final submission for the course.

* The course content must **clearly** specify the topics/ components/ material normally intended to be taught/ discussed in the course. It would help, also, to separate essential and optional content, if applicable.

 ** **Complete details** of texts/ references should be specified, giving as much information as possible about the publisher(s) and/or sources, year of publication, edition, and so on.

*** Note that, there must be **at least** one instructor who is a **permanent** Faculty Member of IIT Bombay for all courses. For **core** courses there must be **at least two** such.

Note to forward an Academic Course Proposal to the Institute Level Academic Bodies from the Academic Unit

The proposal for the Academic Course titled '_____' has been accepted

by the local Academic Body/Bodies (Specify: DUGC/DPGC/IDPC and so on

_____) of the following Academic Unit (Department/ Centre/

School/ ID Group) _____ for recommendation to the Institute level

Academic Bodies (Specify UGPC/PGPC/Jointly to UGPC & PGPC and so on :_____)

and is forwarded hereby, for consideration and necessary action by this Institute level

Academic Body.

Additional Remarks, if any:

Signature with date:

_____
**Convener of the Academic Body
in the Academic Unit/ Head of
Department/ Convener, Interdisciplinary**
Programme

Remarks and Signature of **Dean/Associate Dean, Academic Programmes:**
(Convener/Co-Convener of Institute level Academic Bodies)

Remarks of **Chairman, Senate :**