MAR BASELIOS
COLLEGE OF ENGINEERING AND TECHNOLOGY
AUTONOMOUS

Thiruvananthapuram - 695015

In-house Internship Proposal Form

Proposal No. (*for office use only*): Date of Submission: 12.04.23

1.	Name, Designation and Dept. of Faculty Mentor1, Mentor2 (if, available)	Dr Krishna Mohan GP Assoc. Prof., SH
2.	Title of the Proposal	High Performance Computing using Google Cloud Platform and its Applications in Calculating Bandgap of Semiconductor Materials
3.	Prospective Branch of the intern	CS
3.	Brief Description of the Proposal (Not more than 250 words): The HPC (alias Parallel Processing) is a widely applied computing technique in which Tera Flops of computational power can be achieved. Though on-premise HPC is common in academia/industry, by applying cloud platform tools one can also create an HPC environment in the cloud. And currently more scientific applications (eg., Materials modeling, see https://www.mat3ra.com) are emerged in this field. In this proposal we aimed to build a HPC with more than 500 GFLOPS and would like to benchmark its computational power by using linear algebraic calculations, multi-dimensional Monte-Carlo methods etc. We would also like to run a more rigorous (and an industrial standard) LINPACK benchmark to monitor its computational power. Finally, this HPC will be used to run some parallel codes in computational physics to obtain the band gap of semiconductors (like Si, Ge and its alloys or heterostructure).	
4.	Estimated hours of Student activity: (Minimum 10 to 15 hrs)	20 Hrs
5.	Proposed activity for the students: 1. Writing Shell scripts, Running Linux Commands 2. Programs in C 3. Numerical Methods and its codes 4. Benchmarking GFLOPS 5. Applications of Parallel Codes in HPC to calculate Bandgap	
6.	Expected outcomes	1. Students will be familiarized with Cloud, Linux environment.

		2. HPC building techniques in Cloud Shell 3. Writing/Running Benchmark codes in C 4. Familiarity in Band gap calculations and running parallel codes
7.	Remarks, if any	nil

Name and Signature of Faculty Mentor(s): Dr. Krishna Mohan GP

Recommendations:

Dept. Internship Coordinator
(Name and Signature)
Ms. SREEJA. S.R.

Head of the Department
(Signature)
Dr. Archana P. Das