

### Virtual Lab Mapping for B. Tech in Computer Science & Engineering – 2<sup>nd</sup> Semester

Subject Code	Subject Name	List of Experiment	V-Lab
ES-CS 291	Programming For Problem Solving Lab	1.Numerical Representation 2.Beauty of Numbers 3.More on Numbers 4.Factorials 5.String Operations 6.Recursion 7.Advanced Arithmetic 8.Searching and Sorting	<a href="http://ps-iiith.vlabs.ac.in/">http://ps-iiith.vlabs.ac.in/</a>
BS-CH291	Chemistry-I Laboratory	Expt.1: Determination of Critical Micelle Concentration (CMC) of a Surfactant  Expt.2:Demonstration of pH Effect on Fluorescence Excitation and Emission Spectra of a Fluorophore  Expt.3:Demonstration of Solvent Effects on Fluorescence Spectra of a Fluorophore  Expt.4: Instrumentation and working principles of solutions infra-red (IR) spectroscopy  Expt.5: Conductometric titration for determination of strength of given HCl solution  Expt.6: pH metric titration for the determination of strength of given HCl solution  Expt. 7: Thin layer chromatography	<a href="http://www.vlab.co.in/broad-area-chemical-sciences">http://www.vlab.co.in/broad-area-chemical-sciences</a>
ES-ME291	Engineering Graphics & Design Lab	According to the content of virtual lab	<a href="http://vlabs.iitb.ac.in/vlab-s-dev/labs/mit_bootcamp/enginegraphics_lab/labs/index.php">http://vlabs.iitb.ac.in/vlab-s-dev/labs/mit_bootcamp/enginegraphics_lab/labs/index.php</a>

HM-HU291	Language Laboratory	<ol style="list-style-type: none"><li>1. Teaching the students the basic pronunciation skill using the modules available in this app.</li><li>2. Practice of regular usage of English language in various situations.</li><li>3. Teaching the way of conversation in various situations with appropriate approach.</li><li>4.online presentation</li><li>5. online interview</li></ol>	<a href="https://play.google.com/store/apps/details?id=uk.co.bbc.learningenglish">https://play.google.com/store/apps/details?id=uk.co.bbc.learningenglish</a>
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## Virtual Lab Mapping for B. Tech in Computer Science & Engineering – 4<sup>th</sup> Semester

Subject Code	Subject Name	List of Experiment	V-Lab
PCC-CS492	Computer Architecture Lab	<ol style="list-style-type: none"> <li>1. HDL introduction.</li> <li>2. Basic digital logic base programming with HDL</li> <li>3. 8-bit Addition, Multiplication, Division</li> <li>4. 8-bit Register design</li> <li>5. Memory unit design and perform memory operations.</li> <li>6. 8-bit simple ALU design</li> <li>7. 8-bit simple CPU design 8 Interfacing of CPU and Memory.</li> </ol>	<p><a href="http://vlabs.iitkgp.ernet.in/coa/exp4/index.html">http://vlabs.iitkgp.ernet.in/coa/exp4/index.html</a></p> <p><a href="http://vlabs.iitkgp.ernet.in/coa/exp5/index.html">http://vlabs.iitkgp.ernet.in/coa/exp5/index.html</a></p> <p><a href="http://vlabs.iitkgp.ernet.in/coa/exp7/index.html">http://vlabs.iitkgp.ernet.in/coa/exp7/index.html</a></p> <p><a href="http://vlabs.iitkgp.ernet.in/coa/exp8/index.html">http://vlabs.iitkgp.ernet.in/coa/exp8/index.html</a></p> <p><a href="http://vlabs.iitkgp.ernet.in/coa/exp9/index.html">http://vlabs.iitkgp.ernet.in/coa/exp9/index.html</a></p> <p><a href="http://vlabs.iitkgp.ernet.in/coa/exp10/index.html">http://vlabs.iitkgp.ernet.in/coa/exp10/index.html</a></p>
PCC-CS494	Design & Analysis of Algorithm Lab	<p>Write a C program to find the Sum of Natural Numbers Using Recursion</p> <p>Write a C program to find the Factorial of a Number Using Recursion</p> <p>Write a C program to find the GCD of Two Numbers using Recursion.</p> <p>Write a C program to calculate power using Recursion.</p>	<p><a href="http://ps-iiith.vlabs.ac.in/exp6/Introduction.html?domain=Computer%20Science&amp;lab=Problem%20Solving%20Lab">http://ps-iiith.vlabs.ac.in/exp6/Introduction.html?domain=Computer%20Science&amp;lab=Problem%20Solving%20Lab</a></p> <p><a href="http://ps-iiith.vlabs.ac.in/exp6/Introduction.html?domain=Computer%20Science&amp;lab=Problem%20Solving%20Lab">http://ps-iiith.vlabs.ac.in/exp6/Introduction.html?domain=Computer%20Science&amp;lab=Problem%20Solving%20Lab</a></p> <p><a href="http://ps-iiith.vlabs.ac.in/exp6/Introduction.html?domain=Computer%20Science&amp;lab=Problem%20Solving%20Lab">http://ps-iiith.vlabs.ac.in/exp6/Introduction.html?domain=Computer%20Science&amp;lab=Problem%20Solving%20Lab</a></p> <p><a href="http://ps-iiith.vlabs.ac.in/exp6/Introduction.html?domain=Computer%20Science&amp;lab=Problem%20Solving%20Lab">http://ps-iiith.vlabs.ac.in/exp6/Introduction.html?domain=Computer%20Science&amp;lab=Problem%20Solving%20Lab</a></p>

		<p>Write a C program to solve the Tower of Hanoi problem using Recursion</p> <p>Write a C program to perform searching operation using Linear Search.</p> <p>Write a C program to perform searching operation using Binary Search.</p> <p>Write a C program to implement Quick Sort algorithm</p> <p>Write a C program to implement Merge Sort algorithm.</p> <p>Write a C program to solve N-Queens problem.</p> <p>Write a C program to implement All Pair Shortest Path algorithm</p>	<p><a href="#">Problem%20Solving%20Lab</a></p> <p><a href="http://cse02-iiith.vlabs.ac.in/exp9/index.html">http://cse02-iiith.vlabs.ac.in/exp9/index.html</a></p> <p><a href="http://ds1-iiith.vlabs.ac.in/data-structures-1/exp/unsorted-arrays/exp.html#Unsorted%20Arrays%20vs%20Binary%20Search">http://ds1-iiith.vlabs.ac.in/data-structures-1/exp/unsorted-arrays/exp.html#Unsorted%20Arrays%20vs%20Binary%20Search</a></p> <p><a href="http://ds1-iiith.vlabs.ac.in/data-structures-1/exp/unsorted-arrays/exp.html#Unsorted%20Arrays%20vs%20Binary%20Search">http://ds1-iiith.vlabs.ac.in/data-structures-1/exp/unsorted-arrays/exp.html#Unsorted%20Arrays%20vs%20Binary%20Search</a></p> <p><a href="http://ds1-iiith.vlabs.ac.in/data-structures-1/exp/quicksort/exp.html#Quick%20Sort%20Experiment">http://ds1-iiith.vlabs.ac.in/data-structures-1/exp/quicksort/exp.html#Quick%20Sort%20Experiment</a></p> <p><a href="http://ds1-iiith.vlabs.ac.in/data-structures-1/exp/mergesort/exp.html#Merge%20Sort">http://ds1-iiith.vlabs.ac.in/data-structures-1/exp/mergesort/exp.html#Merge%20Sort</a></p> <p><a href="http://vlabs.iitb.ac.in/vlabs-dev/labs/mit_bootcamp/compiler_networks/labs/exp1/index.php">http://vlabs.iitb.ac.in/vlabs-dev/labs/mit_bootcamp/compiler_networks/labs/exp1/index.php</a></p>
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		<p>Write a C program to find the minimum spanning tree to implement Prim's algorithm/ Kruskal's algorithm using greedy method.</p> <p>Write a C program to implement graph traversal using Breadth First Search/ Depth First Search algorithm</p>	<p><a href="https://cse01-iiith.vlabs.ac.in/exp8/Simulation.html?domain=Computer%20Science&amp;lab=Data%20Structures#">https://cse01-iiith.vlabs.ac.in/exp8/Simulation.html?domain=Computer%20Science&amp;lab=Data%20Structures#</a></p> <p><a href="http://ds2-iiith.vlabs.ac.in/data-structures-2/exp/mst/exp.html#Kruskal's%20Algorithm">http://ds2-iiith.vlabs.ac.in/data-structures-2/exp/mst/exp.html#Kruskal's%20Algorithm</a></p> <p><a href="http://ds1-iiith.vlabs.ac.in/data-structures-1/exp/bfs/exp.html#Breadth%20First%20Search">http://ds1-iiith.vlabs.ac.in/data-structures-1/exp/bfs/exp.html#Breadth%20First%20Search</a></p> <p><a href="http://ds1-iiith.vlabs.ac.in/data-structures-1/exp/dfs/exp.html#Depth%20First%20Traversal">http://ds1-iiith.vlabs.ac.in/data-structures-1/exp/dfs/exp.html#Depth%20First%20Traversal</a></p>
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## Virtual Lab Mapping for B. Tech in Computer Science & Engineering – 6<sup>th</sup> Semester

Subject Code	Subject Name	List of Experiment	V-Lab
CS691	Database Management System Lab	<p>Structured Query Language</p> <ol style="list-style-type: none"> <li>1. Creating Database <ul style="list-style-type: none"> <li>• Creating a Database</li> <li>• Creating a Table</li> <li>• Specifying Relational Data Types</li> <li>• Specifying Constraints</li> <li>• Creating Indexes</li> </ul> </li> <li>2. Table and Record Handling <ul style="list-style-type: none"> <li>• INSERT statement</li> <li>• Using SELECT and INSERT together</li> <li>• DELETE, UPDATE, TRUNCATE statements</li> <li>• DROP, ALTER statements</li> </ul> </li> <li>3. Retrieving Data from a Database <ol style="list-style-type: none"> <li>1. The SELECT statement</li> <li>2. Using the WHERE clause</li> <li>3. Using Logical Operators in the WHERE clause</li> <li>4. Using IN, BETWEEN, LIKE , ORDER BY, GROUP BY and HAVING Clause</li> <li>5. Using Aggregate Functions</li> <li>6. Combining Tables Using JOINS</li> <li>7. Subqueries</li> </ol> </li> <li>4. Database Management <ul style="list-style-type: none"> <li>• Creating Views</li> <li>• Creating Column Aliases</li> <li>• Creating Database Users</li> <li>• Using GRANT and REVOKE</li> </ul> </li> </ol>	<p>For SQL :  <a href="https://livesql.oracle.com/apex/f?p=590:1000:::NO:: and">https://livesql.oracle.com/apex/f?p=590:1000:::NO:: and</a>  <a href="http://vlabs.iitb.ac.in/bootcamp/labs/dbms/exp8/index.php">http://vlabs.iitb.ac.in/bootcamp/labs/dbms/exp8/index.php</a></p> <p><a href="http://vlabs.iitb.ac.in/vlabs-dev/labs/dblab/index.php">http://vlabs.iitb.ac.in/vlabs-dev/labs/dblab/index.php</a></p>

		<p>Cursors in Oracle PL / SQL</p> <p>Writing Oracle PL / SQL Stored Procedures</p>	
CS692	Computer Networks Lab	<p>1) NIC Installation &amp; Configuration (Windows/Linux)</p> <p>2) Understanding IP address, subnet etc Familiarization with</p> <ul style="list-style-type: none"> <li>• Networking cables (CAT5, UTP)</li> <li>• Connectors (RJ45, T-connector) • Hubs, Switches</li> </ul> <p>3) TCP/UDP Socket Programming</p> <ul style="list-style-type: none"> <li>• Simple, TCP based, UDP based</li> <li>• Multicast &amp; Broadcast Sockets</li> <li>• Implementation of a Prototype Multithreaded Server</li> </ul> <p>4) Implementation of Data Link Layer Flow Control Mechanism (Stop &amp; Wait, Sliding Window)</p> <p>Data Link Layer Error Detection Mechanism (Cyclic Redundancy Check)</p> <p>Data Link Layer Error Control Mechanism (Selective Repeat, Go Back N)</p> <p>5) Server Setup/Configuration FTP, TelNet, NFS, DNS, Firewall</p>	<p><a href="http://vlabs.iitb.ac.in/vlabs-dev/labs_local/computer-networks/labs/explicit.php">http://vlabs.iitb.ac.in/vlabs-dev/labs_local/computer-networks/labs/explicit.php</a></p>
CS693	Operating Systems Lab	<ol style="list-style-type: none"> <li>1. UNIX Commands and applications</li> <li>2. Shell programming (User input &amp; conditional branching, Loop &amp; Switch case, Functions, Arrays, Command line arguments,</li> <li>3. Programming (Process, Signal, Semaphore, POSIX threads, inter process communications)</li> </ol>	<p><a href="http://www.oslab.ch/">http://www.oslab.ch/</a></p> <p><a href="https://www.shellscript.sh/">https://www.shellscript.sh/</a></p>
<b>Virtual Lab Mapping for B. Tech in Computer Science &amp; Engineering – 8<sup>th</sup> Semester</b>			
Subject Code	Subject Name	List of Experiment	V-Lab

CS891	Design Lab	Module 1: Assignments on C and C++ ; Basic and Intermediate Levels or Module 2: Assignments on Python or Module 3: Assignments on PHP & MySQL	<a href="http://www.spoken-tutorial.org">http://www.spoken-tutorial.org</a>