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**List of Useful links recommended in University of Mumbai syllabus BE  
under Faculty of Science and Technology (AY 2019-20 (R) for the CE, IT,  
EXTC & ME branches**

**EXTC /SEM III (ECC 302) Electronics Devices & Circuits**

1 [https://onlinecourses.nptel.ac.in/noc20\\_ee89/preview](https://onlinecourses.nptel.ac.in/noc20_ee89/preview)

**EXTC /SEM III (ECC 303) Digital System Design**

1 [https://onlinecourses.nptel.ac.in/noc20\\_ee70/preview](https://onlinecourses.nptel.ac.in/noc20_ee70/preview)

**EXTC /SEM III (ECC 304) Network Theory**

1 [https://onlinecourses.nptel.ac.in/noc20\\_ee64/preview](https://onlinecourses.nptel.ac.in/noc20_ee64/preview)

**EXTC /SEM III (ECC 305) Electronic Instrumentation & Control Systems**

1 [https://onlinecourses.nptel.ac.in/noc20\\_ee90/preview](https://onlinecourses.nptel.ac.in/noc20_ee90/preview)

**EXTC /SEM III (ECL 304 ) Skill lab: C++ and Java programming**

1 <https://raptor.martincarlisle.com/>

2 <https://www.eclipse.org/>

3 <https://netbeans.apache.org/download/index.html>

4 <https://www.codeblocks.org/>

5 <http://www.jedit.org/>

## EXTC /SEM III (ECM 301 ) Mini Project 1A: Analog & Digital Circuit Design

1	<a href="https://www.analog.com/en/design-center/design-tools-and-calculators/ltspice-simulator.html">https://www.analog.com/en/design-center/design-tools-and-calculators/ltspice-simulator.html</a>
2	<a href="https://www.autodesk.in/products/eagle/free-download">https://www.autodesk.in/products/eagle/free-download</a>
3	<a href="https://www.orcad.com/">https://www.orcad.com/</a>
4	<a href="https://www.multisim.com/">https://www.multisim.com/</a>
5	<a href="https://www.ti.com/design-resources/design-tools-simulation/webench-power-designer.html">https://www.ti.com/design-resources/design-tools-simulation/webench-power-designer.html</a>
6	<a href="https://www.tinkercad.com/">https://www.tinkercad.com/</a>
7	<a href="https://www.electronicsforu.com/">https://www.electronicsforu.com/</a>
8	<a href="https://circuitdigest.com/">https://circuitdigest.com/</a>
9	<a href="https://www.electronicshub.org/">https://www.electronicshub.org/</a>

## Information technology

### IT /SEM III (ITC 302) Data Structure & Analysis

1	<a href="https://opendatastructures.org/">https://opendatastructures.org/</a>
2	<a href="https://www.coursera.org/in">https://www.coursera.org/in</a>

### IT /SEM III (ITC 303) Database Management Systems

1	<a href="https://www.oreilly.com/">https://www.oreilly.com/</a>
2	<a href="https://www.coursera.org/in">https://www.coursera.org/in</a>

### IT /SEM III (ITC 304) Principles of Communication

1	<a href="https://www.classcentral.com/">https://www.classcentral.com/</a>
2	<a href="https://www.vlab.co.in/">https://www.vlab.co.in/</a>

### **IT /SEM III (ITC 305) Paradigms & Computer Programming Fundamentals**

1	<a href="https://www.classcentral.com/course/edx-paradigms-of-computer-programming-fundamentals-2298">https://www.classcentral.com/course/edx-paradigms-of-computer-programming-fundamentals-2298</a>
2	<a href="https://www.udemy.com/">https://www.udemy.com/</a>
<b>IT /SEM III (ITL 303) Computer Programming &amp; Paradigms Lab</b>	
1	<a href="https://software-lab.org/teaching/winter2019/pp/">https://software-lab.org/teaching/winter2019/pp/</a>
2	<a href="https://web.mit.edu/alexmv/6.037/#:~:text=Introduction,thought%20patterns%20for%20computer%20science">https://web.mit.edu/alexmv/6.037/#:~:text=Introduction,thought%20patterns%20for%20computer%20science</a>
3	<a href="https://www.edx.org/course/paradigms-of-computer-programming-fundamentals#:~:text=This%20course%20covers%20functional%2C%20object,fragments%20and%20a%20simple%20semantics">https://www.edx.org/course/paradigms-of-computer-programming-fundamentals#:~:text=This%20course%20covers%20functional%2C%20object,fragments%20and%20a%20simple%20semantics</a>
4	<a href="https://www.tutorialspoint.com/haskell/index.htm">https://www.tutorialspoint.com/haskell/index.htm</a>

## **Computer Engineering**

### **CE /SEM III (CSC 302 ) Discrete Structures & Graph Theory**

1	<a href="https://www.edx.org/learn/discrete-mathematics">https://www.edx.org/learn/discrete-mathematics</a>
2	<a href="https://www.coursera.org/in">https://www.coursera.org/in</a>
3	<a href="https://nptel.ac.in/courses/106/106/106106094/">https://nptel.ac.in/courses/106/106/106106094/</a>

### **CE /SEM III (CSE 303 ) Data Structures**

1	<a href="https://www.coursera.org/specializations/data-structures-algorithms">https://www.coursera.org/specializations/data-structures-algorithms</a>
2	<a href="https://www.edx.org/course/data-structures-fundamentals">https://www.edx.org/course/data-structures-fundamentals</a>
3	<a href="https://nptel.ac.in/courses/106/102/106102064/">https://nptel.ac.in/courses/106/102/106102064/</a>
4	<a href="https://onlinecourses.nptel.ac.in/noc19_cs67/preview">https://onlinecourses.nptel.ac.in/noc19_cs67/preview</a>

### **CE /SEM III (CSE 304 ) Digital Logic & Computer Organization & Architecture**

1	<a href="https://www.classcentral.com/course/swayam-computer-organization-and-architecture-a-pedagogical-aspect-9824">https://www.classcentral.com/course/swayam-computer-organization-and-architecture-a-pedagogical-aspect-9824</a>
2	<a href="https://www.coursera.org/learn/comparch">https://www.coursera.org/learn/comparch</a>
3	<a href="https://www.edx.org/learn/computer-architecture">https://www.edx.org/learn/computer-architecture</a>
4	<a href="https://nptel.ac.in/courses/106/103/106103068/#">https://nptel.ac.in/courses/106/103/106103068/#</a>

### **CE /SEM III (CSE 305 ) Computer Graphics**

1	<a href="https://www.classcentral.com/course/interactivegraphics-2067">https://www.classcentral.com/course/interactivegraphics-2067</a>
2	<a href="https://onlinecourses.swayam2.ac.in/ntr20_ed15/preview">https://onlinecourses.swayam2.ac.in/ntr20_ed15/preview</a>
3	<a href="https://nptel.ac.in/courses/106/106/106106090/">https://nptel.ac.in/courses/106/106/106106090/</a>
4	<a href="https://www.edx.org/course/computer-graphics-2">https://www.edx.org/course/computer-graphics-2</a>

### **CE /SEM III (CSL 301 ) Data Structures Lab**

1	<a href="https://leetcode.com/">https://leetcode.com/</a>
2	<a href="https://www.hackerrank.com/">https://www.hackerrank.com/</a>
3	<a href="https://www.cs.usfca.edu/~galles/visualization/Algorithms.html">https://www.cs.usfca.edu/~galles/visualization/Algorithms.html</a>
4	<a href="https://www.codechef.com/">https://www.codechef.com/</a>

### **CE /SEM III (CSL 304 ) Skill based lab: OOP with Java**

1	<a href="http://www.nptelvideos.in/">http://www.nptelvideos.in/</a>
2	<a href="https://www.w3schools.com/">https://www.w3schools.com/</a>
3	<a href="https://www.tutorialspoint.com/index.htm">https://www.tutorialspoint.com/index.htm</a>
4	<a href="https://www.starcertification.org/Certifications/Certificate/securejava">https://www.starcertification.org/Certifications/Certificate/securejava</a>

### **Mechanical Engineering**

### **ME /SEM III (MEC 301 ) Engineering Mathematics**

1	<a href="https://nptel.ac.in/courses/111/104/111104085/">https://nptel.ac.in/courses/111/104/111104085/</a>
2	<a href="https://nptel.ac.in/courses/111/106/111106139/">https://nptel.ac.in/courses/111/106/111106139/</a>

### **ME /SEM III (MEC 302) Strength of Materials**

1	<a href="http://www.nptelvideos.in/2012/11/strength-of-materials-prof.html">http://www.nptelvideos.in/2012/11/strength-of-materials-prof.html</a>
2	<a href="https://onlinecourses.nptel.ac.in/noc20_ce34/preview">https://onlinecourses.nptel.ac.in/noc20_ce34/preview</a>

### **ME /SEM III (MEC 303) Production Processes**

1	<a href="https://nptel.ac.in/courses/112/107/112107219/">https://nptel.ac.in/courses/112/107/112107219/</a>
2	<a href="https://nptel.ac.in/courses/112/107/112107215/">https://nptel.ac.in/courses/112/107/112107215/</a>
3	<a href="https://nptel.ac.in/courses/112/107/112107084/">https://nptel.ac.in/courses/112/107/112107084/</a>
4	<a href="https://nptel.ac.in/courses/112/107/112107144/">https://nptel.ac.in/courses/112/107/112107144/</a>
5	<a href="https://nptel.ac.in/courses/112/107/112107078/">https://nptel.ac.in/courses/112/107/112107078/</a>
6	<a href="https://nptel.ac.in/courses/112/107/112107239/">https://nptel.ac.in/courses/112/107/112107239/</a>

7	<a href="https://nptel.ac.in/courses/112/104/112104195/">https://nptel.ac.in/courses/112/104/112104195/</a>
8	<a href="https://nptel.ac.in/courses/112/107/112107219/">https://nptel.ac.in/courses/112/107/112107219/</a>
9	<a href="https://nptel.ac.in/courses/112/107/112107144/">https://nptel.ac.in/courses/112/107/112107144/</a>
10	<a href="https://nptel.ac.in/courses/112/107/112107213/">https://nptel.ac.in/courses/112/107/112107213/</a>
11	<a href="https://nptel.ac.in/courses/112/107/112107090/">https://nptel.ac.in/courses/112/107/112107090/</a>
12	<a href="https://nptel.ac.in/courses/113/106/113106087/">https://nptel.ac.in/courses/113/106/113106087/</a>
13	<a href="https://nptel.ac.in/courses/112/103/112103263/">https://nptel.ac.in/courses/112/103/112103263/</a>
14	<a href="https://nptel.ac.in/courses/112/107/112107239/">https://nptel.ac.in/courses/112/107/112107239/</a>
15	<a href="https://nptel.ac.in/courses/112/106/112106153/">https://nptel.ac.in/courses/112/106/112106153/</a>
16	<a href="https://nptel.ac.in/courses/112/107/112107250/">https://nptel.ac.in/courses/112/107/112107250/</a>
17	<a href="https://nptel.ac.in/courses/112/107/112107144/">https://nptel.ac.in/courses/112/107/112107144/</a>
18	<a href="https://nptel.ac.in/courses/112/107/112107239/">https://nptel.ac.in/courses/112/107/112107239/</a>
19	<a href="https://nptel.ac.in/courses/112/107/112107219/">https://nptel.ac.in/courses/112/107/112107219/</a>

**ME /SEM III (MEC 304 )Materials and Metallurgy**

1	<a href="https://nptel.ac.in/noc/courses/noc20/SEM1/noc20-mm09/">https://nptel.ac.in/noc/courses/noc20/SEM1/noc20-mm09/</a>
2	<a href="https://nptel.ac.in/courses/113/102/113102080/">https://nptel.ac.in/courses/113/102/113102080/</a>
3	<a href="https://nptel.ac.in/courses/112/104/112104229/">https://nptel.ac.in/courses/112/104/112104229/</a>
4	<a href="https://nptel.ac.in/courses/118/104/118104008/">https://nptel.ac.in/courses/118/104/118104008/</a>

**ME /SEM III (MEC 305 )Thermodynamics**

1	<a href="https://nptel.ac.in/courses/112/105/112105266/">https://nptel.ac.in/courses/112/105/112105266/</a>
2	<a href="https://nptel.ac.in/courses/112/103/112103275/">https://nptel.ac.in/courses/112/103/112103275/</a>
3	<a href="https://nptel.ac.in/courses/112/105/112105220/">https://nptel.ac.in/courses/112/105/112105220/</a>
4	<a href="https://nptel.ac.in/courses/101/104/101104063/">https://nptel.ac.in/courses/101/104/101104063/</a>

### **EXTC /SEM V (ECC 501) Digital Communication**

1	<a href="https://nptel.ac.in/courses/108/101/108101113/">https://nptel.ac.in/courses/108/101/108101113/</a>
2	<a href="https://nptel.ac.in/courses/108/102/108102096/">https://nptel.ac.in/courses/108/102/108102096/</a>
3	<a href="https://nptel.ac.in/courses/108/102/108102120/">https://nptel.ac.in/courses/108/102/108102120/</a>

### **EXTC /SEM V (ECC 502) Discrete-Time Signal Processing**

1	<a href="http://www.nptelvideos.in/2012/12/digital-signal-processing.html">http://www.nptelvideos.in/2012/12/digital-signal-processing.html</a>
2	<a href="https://nptel.ac.in/courses/108/101/108101174/">https://nptel.ac.in/courses/108/101/108101174/</a>
3	<a href="https://nptel.ac.in/courses/108/105/108105055/">https://nptel.ac.in/courses/108/105/108105055/</a>

### **EXTC /SEM V (ECC 503) Digital VLSI**

1	<a href="https://nptel.ac.in/courses/117/101/117101058/">https://nptel.ac.in/courses/117/101/117101058/</a>
2	<a href="https://nptel.ac.in/courses/108/107/108107129/">https://nptel.ac.in/courses/108/107/108107129/</a>

### **EXTC /SEM V (ECC 504) Random Signal Analysis**

1	<a href="https://onlinecourses.nptel.ac.in/noc21_ma01/preview">https://onlinecourses.nptel.ac.in/noc21_ma01/preview</a>
2	<a href="https://onlinecourses.swayam2.ac.in/cec21_ma02/preview">https://onlinecourses.swayam2.ac.in/cec21_ma02/preview</a>

## EXTC /SEM V (ECM 501) Mini Project 2A: Embedded System Project

1	<a href="https://circuitdigest.com/">https://circuitdigest.com/</a>
2	<a href="https://github.com/">https://github.com/</a>
3	<a href="https://www.electronicshub.org/">https://www.electronicshub.org/</a>
4	<a href="https://www.hackster.io/">https://www.hackster.io/</a>
5	<a href="https://onlinecourses.nptel.ac.in/noc20_ee98/preview">https://onlinecourses.nptel.ac.in/noc20_ee98/preview</a>
6	<a href="https://onlinecourses.nptel.ac.in/noc20_cs15/preview">https://onlinecourses.nptel.ac.in/noc20_cs15/preview</a>
7	<a href="https://nptel.ac.in/courses/108/102/108102045/">https://nptel.ac.in/courses/108/102/108102045/</a>
8	<a href="https://www.udemy.com/course/mastering-microcontroller-with-peripheral-driver-development/">https://www.udemy.com/course/mastering-microcontroller-with-peripheral-driver-development/</a>
9	<a href="https://e2e.ti.com/support/archive/universityprogram/educators/w/wiki/2103/training-support">https://e2e.ti.com/support/archive/universityprogram/educators/w/wiki/2103/training-support</a>
10	<a href="https://e2e.ti.com/support/archive/universityprogram/educators/w/wiki/2035/textbooks">https://e2e.ti.com/support/archive/universityprogram/educators/w/wiki/2035/textbooks</a>

## Computer Engineering

### CE /SEM V (CSC 501) Theoretical Computer Science

1	<a href="https://www.jflap.org/">https://www.jflap.org/</a>
2	<a href="https://nptel.ac.in/courses/106/104/106104028/">https://nptel.ac.in/courses/106/104/106104028/</a>
3	<a href="https://nptel.ac.in/courses/106/104/106104148/">https://nptel.ac.in/courses/106/104/106104148/</a>

### CE /SEM V (CSC 502) Software Engineering

1	<a href="https://nptel.ac.in/courses/106/105/106105182/">https://nptel.ac.in/courses/106/105/106105182/</a>
2	<a href="https://onlinecourses.nptel.ac.in/noc19_cs69/preview">https://onlinecourses.nptel.ac.in/noc19_cs69/preview</a>
3	<a href="https://www.mooc-list.com/course/software-engineering-introduction-edx">https://www.mooc-list.com/course/software-engineering-introduction-edx</a>

### CE /SEM V (CSC 503) Computer Network

1	<a href="https://www.netacad.com/courses/networking/networking-essentials">https://www.netacad.com/courses/networking/networking-essentials</a>
2	<a href="https://www.coursera.org/learn/computer-networking">https://www.coursera.org/learn/computer-networking</a>
3	<a href="https://nptel.ac.in/courses/106/105/106105081/">https://nptel.ac.in/courses/106/105/106105081/</a>
4	<a href="https://www.edx.org/course/introduction-to-networking">https://www.edx.org/course/introduction-to-networking</a>

### CE /SEM V (CSC 504) Data warehousing and Mining

1	<a href="https://onlinecourses.nptel.ac.in/noc20_cs12/preview">https://onlinecourses.nptel.ac.in/noc20_cs12/preview</a>
2	<a href="https://www.coursera.org/specializations/data-mining">https://www.coursera.org/specializations/data-mining</a>

## Information Technology

### IT /SEM V (ITC 501) Internet Programming

1	<a href="https://reactjs.org/tutorial/tutorial.html">https://reactjs.org/tutorial/tutorial.html</a>
2	<a href="https://react-redux.js.org/introduction/getting-started">https://react-redux.js.org/introduction/getting-started</a>
3	<a href="https://webpack.js.org/">https://webpack.js.org/</a>

### IT /SEM V (ITC 502) Computer Network Security

1	<a href="https://swayam.gov.in/">https://swayam.gov.in/</a>
2	<a href="https://nptel.ac.in/">https://nptel.ac.in/</a>
3	<a href="https://www.coursera.org/in">https://www.coursera.org/in</a>
4	<a href="https://www.rsa.com/">https://www.rsa.com/</a>

### IT /SEM V (ITC 503) Entrepreneurship & E-business

### IT /SEM V (ITC 504) Software Engineering

1	<a href="https://nptel.ac.in/courses/106/101/106101061/">https://nptel.ac.in/courses/106/101/106101061/</a>
2	<a href="https://www.youtube.com/watch?v=wEr6mwquPLY">https://www.youtube.com/watch?v=wEr6mwquPLY</a>
3	<a href="https://www.nptelvideos.com/video.php?id=911&amp;c=9">https://www.nptelvideos.com/video.php?id=911&amp;c=9</a>
4	<a href="https://onlinecourses.nptel.ac.in/noc19_cs70/preview">https://onlinecourses.nptel.ac.in/noc19_cs70/preview</a>

### IT /SEM V (ITL 501) IP Lab

1	<a href="https://www.tutorialspoint.com/index.htm">https://www.tutorialspoint.com/index.htm</a>
2	<a href="https://reactjs.org/tutorial/tutorial.html">https://reactjs.org/tutorial/tutorial.html</a>
3	<a href="https://nodejs.dev/learn">https://nodejs.dev/learn</a>

### IT /SEM V (ITL 502) Security Lab

1	<a href="https://cse29-iiith.vlabs.ac.in/">https://cse29-iiith.vlabs.ac.in/</a>
2	<a href="https://www.dcode.fr/en">https://www.dcode.fr/en</a>

## Mechanical Engineering

### ME /SEM V (MEC 501) Mechanical Measurements & Controls

1	<a href="https://nptel.ac.in/courses/112/103/112103261/">https://nptel.ac.in/courses/112/103/112103261/</a>
2	<a href="https://nptel.ac.in/courses/112/107/112107242/">https://nptel.ac.in/courses/112/107/112107242/</a>
3	<a href="https://nptel.ac.in/courses/112/106/112106138/">https://nptel.ac.in/courses/112/106/112106138/</a>

### ME /SEM V (MEC 502) Thermal Engineering

1	<a href="https://nptel.ac.in/courses/112/101/112101097/">https://nptel.ac.in/courses/112/101/112101097/</a>
2	<a href="https://nptel.ac.in/courses/112/105/112105248/">https://nptel.ac.in/courses/112/105/112105248/</a>
3	<a href="https://nptel.ac.in/courses/112/104/112104033/">https://nptel.ac.in/courses/112/104/112104033/</a>
4	<a href="https://nptel.ac.in/courses/112/103/112103262/">https://nptel.ac.in/courses/112/103/112103262/</a>

### ME /SEM V (MEC 503) Dynamics of Machinery

1	<a href="https://nptel.ac.in/courses/112/101/112101096/">https://nptel.ac.in/courses/112/101/112101096/</a>
2	<a href="https://nptel.ac.in/courses/112/107/112107212/">https://nptel.ac.in/courses/112/107/112107212/</a>

### ME /SEM V (MEC 504) Finite Element Analysis

1	<a href="https://nptel.ac.in/courses/112/104/112104193/">https://nptel.ac.in/courses/112/104/112104193/</a>
2	<a href="https://nptel.ac.in/courses/105/106/105106051/">https://nptel.ac.in/courses/105/106/105106051/</a>
3	<a href="https://nptel.ac.in/courses/112/104/112104115/">https://nptel.ac.in/courses/112/104/112104115/</a>
4	<a href="https://nptel.ac.in/courses/112/103/112103295/">https://nptel.ac.in/courses/112/103/112103295/</a>
5	<a href="https://nptel.ac.in/courses/112/106/112106135/">https://nptel.ac.in/courses/112/106/112106135/</a>

6	<a href="https://nptel.ac.in/courses/112/106/112106130/">https://nptel.ac.in/courses/112/106/112106130/</a>
7	<a href="https://nptel.ac.in/courses/105/105/105105041/">https://nptel.ac.in/courses/105/105/105105041/</a>
8	<a href="https://nptel.ac.in/courses/112/104/112104116/">https://nptel.ac.in/courses/112/104/112104116/</a>

### **ME /SEM V (MEL 501) Thermal Engineering**

1	<a href="https://mfts-iitg.vlabs.ac.in/">https://mfts-iitg.vlabs.ac.in/</a>
2	<a href="https://vlab.amrita.edu/index.php?sub=1&amp;brch=194">https://vlab.amrita.edu/index.php?sub=1&amp;brch=194</a>
3	<a href="http://vlabs.iitkgp.ernet.in/rtvlas/#">http://vlabs.iitkgp.ernet.in/rtvlas/#</a>

### **ME /SEM V (MEL 502) Dynamics of Machinery**

1	<a href="https://dom-nitk.vlabs.ac.in/List%20of%20experiments.html">https://dom-nitk.vlabs.ac.in/List%20of%20experiments.html</a>
2	<a href="https://mdmv-nitk.vlabs.ac.in/">https://mdmv-nitk.vlabs.ac.in/</a>
3	<a href="https://mv-iitg.vlabs.ac.in/">https://mv-iitg.vlabs.ac.in/</a>

## **Electronics & Telecommunication Engineering**

### **EXTC /SEM VII (ECC 701) Microwave Engineering**

### **EXTC /SEM VII (ECC 702) Mobile Communication System**

- |   |   |
|---|---|
| 1 | <a href="https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-452-principles-of-wireless-communications-spring-2006/">https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-452-principles-of-wireless-communications-spring-2006/</a> |
| 2 | <a href="https://www.vlab.co.in/">https://www.vlab.co.in/</a>   |

### **EXTC /SEM VII (ECC 703) Optical Communication**

### **EXTC /SEM VII (ECL 702) Mobile Communication Systems Lab**

- |   |   |
|---|---|
| 1 | <a href="https://www.isi.edu/nsnam/ns/">https://www.isi.edu/nsnam/ns/</a>   |
| 2 | <a href="https://www.vlab.co.in/">https://www.vlab.co.in/</a>   |
| 3 | <a href="https://www.scilab.in/textbook_companion/generate_book/2081">https://www.scilab.in/textbook_companion/generate_book/2081</a> |