



ವಿಶ್ವವಿದ್ಯಾರ್ಥಿ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

"ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ  
ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ

**Visvesvaraya Technological University**

(State University of Government of Karnataka Established as per the VTU Act, 1994)

"Jnana Sangama" Belagavi-590018, Karnataka, India



Prof. B.E. Rangaswamy Ph.D.

Registrar

Phone (0831) 2405468

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Ref. No. VTU/Aca/BOS/ A-12/ 2022-23/ 752

Date 2 MAY 2023

Meeting Notice

**Sub: VTU Board of Studies Meeting in Biotechnology on 18<sup>th</sup> May 2023 at 11.00 AM.. reg.  
Ref : Mail from the Chairman dated 11-5-2023.**

With reference to the above, the Board of Studies in Biotechnology meeting is convened on 18<sup>th</sup> May 2023 at 11 AM at the VTU regional Office, Bengaluru at 11.00 AM.

**Agenda-**

1. Finalization of the Content of the Syllabi for the Courses as per the 2022 Scheme of Teaching and Examination
2. Planning of Suitable workshop towards the New Courses and Open Electives.

I request you to kindly accept the invitation and please make it convenient to attend the meeting and help us in smooth conduct of the proceedings.

Thanking you,

To,

|    |   |          |
|----|---|----------|
| 1. | Dr. Krishna Prasad, Professor & Head, Dept. of Bio Technology, PA College of Engineering, Nadupadavu, Near Mangalore University, Mangalore. Mobile 9448529048, email: hod_biotech@pace.edu.in                   | Chairman |
| 2. | Dr. N. S. Manjunath, Professor & Head, Dept. of Bio Technology, Bapuji Institute of Engg. & Tech., Shamnoor Road, Davangere Mobile: 8762221973, email: nsm.microb1973@gmail.com                                 | Member   |
| 3. | Dr. Veena S. More, Professor, Saptagiri College of Engg., Chikkasandra, Hesaraghatta Main Road, Bangalore - 560 057, Mobile: 9480491608 email: veenasmore@sapthagiri.edu.in                                     | Member   |
| 4. | Dr. Priya Narayan, Associate Professor, Dept. of Bio Technology, Sir M. Visvesvaraya Institute of Technology, Krishnadevarayanagar, Hunasamaranahalli, Bengaluru, Mobile: 9880993818, email: brunaboy@gmail.com | Member   |
| 5. | Dr. S. Balasubramanya, General Manager, Association of Biotech-led Enterprises (ABLE), 123/C, 16'h Main Road, 5'h Cross, 4' Block, Koramangala, Bengaluru - 560 034.  | Member   |
| 6. | Dr. S. Chandrashekar, Chairman & CEO, Vipfagen Biosciences Pvt.Ltd., #278, 13th Cross, 5'h Main, Dollars Colony, RMV 2nd Stage, Bengaluru - 560 094   | Member   |

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Bengaluru - 560 057



|    |  |                 |
|----|--|-----------------|
| 7  | Dr. H G Nagendra, Professor & Head, Department of Bio-Technology, Sir M Visvesvaraya Institute of Technology, Bangalore 562 157, nagendra_biotech@simvit.edu | Special Invitee |
| 8  | Dr. Nagashree N Rao, Associate Professor, RVCE, Bengaluru. Email: nagashreenrao@rvce.edu.in  | Special Invitee |
| 9  | Dr. Shridhar Narayanana, Director and CEO, Foundation for Neglected Diseases Research , Bengaluru :email" shridhar.narayanan@fndr.in                         | Special Invitee |
| 10 | Dr. Pratima Khandelwal, Founder, Fly Excellence Educational Services Bengaluru, pratima2k1@gmail.com   | Special Invitee |
| 11 | Dr. Uttam Doraswamy, Founder and Director, Elxion Pvt. Ltd. Bengaluru, uttamrd@gmail.com   | Special Invitee |



**Copy to:**

1. The Vice-Chancellor, through the secretary to V.C., VTU, Belagavi for information.
2. The Finance Officer, VTU Belagavi, for information.
3. The Registrar's Office, VTU, Belagavi, for information.
4. The In-Charge Regional Director, VTU Regional Office, Bengaluru, to make necessary arrangements for the meeting including hospitality and disbursement of TA/DA sitting fees and remuneration as applicable to the members.

**Note:**

1. All the Members and Special Invitees are requested to make their own arrangements towards transportation to attend the meeting.
2. All the Members and Special Invitees are requested to produce Onward and Return Journey Tickets/Vouchers for the disbursement of travelling allowances
3. The TA will be disbursed as per KCSR/Government Circulars and orders only.

  
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 12/05/23 RE  
 REGISTRAR  




## **BOARD OF STUDIES, BIOTECHNOLOGY BOARD**

### **BOARD OF STUDIES MEETING HELD**

### **AT VTU REGIONAL CENTRE, BANGALORE**

### **MINUTES OF THE MEETING**

The Board of Studies meeting was held on 18th of May 2023 at VTU Regional Office, Bangalore. The meeting was chaired by Dr Krishna Prasad, Chairman, Board of Studies, Biotechnology Board.

The Agenda was

1. Discussion of detailed 2022 Scheme of B.E. Biotechnology
2. Discussion of content and distribution of work load for content refinement and new content for subjects.
3. Discussion of workshops for syllabus discussion.


The following members were present at the meeting

1. Dr Krishna Prasad, Prof and Head, Dept of Biotechnology, PACE, Mangalore
2. Dr Veena More, Prof, Dept of Biotechnology, Sapthagiri College of Engineering, Bangalore
3. Dr Priya Narayan, Prof Dept of Biotechnology, Sir M Visvesvaraya Institute of Technology, Bangalore
4. Dr S Balasubramanya, General Manager, ABLE, Bangalore (Industry Expert)
5. Dr H G Nagendra, Prof & Head, Dept of Biotechnology, Sir M Visvesvaraya Institute of Technology, Bangalore
6. Dr Nagashree N Rao, Prof., Dept of Biotechnology, RVCE, Bangalore
7. Dr Pratima Khandelwal, Founder, Fly Excellence Educational Services, Bangalore.

The Chairman welcomed the members and Special invitees to the meeting. The meeting began with the 3<sup>rd</sup> Semester scheme. Members suggested that the 3<sup>rd</sup> semester and 4<sup>th</sup> semester should focus more on basic aspects. Members also suggested that Python Programming being an ESC course should have the credit breakup as 2:2:0:0 to enable problem solving. All ESC courses were retained. Members also suggested that Linux Programming for Biologists and Data presentation, Error Analysis and Inferences should be a lab component in the AEC.

The industry experts and Special invitees suggested that all the AEC courses at 4<sup>th</sup> semester be a lab component. Under the ESC course, Marine Bio resources and applications was added as a basic course since the field of Biopharmaceuticals from marine sources are being tapped today.

As suggested by Dr Balasubramanyas, the Bio business and Entrepreneurship was renamed as Bio economy and Entrepreneurship. The Enzyme Technology course from the VI semester was moved to the 5<sup>th</sup> semester as an IPCC course. Forensic Biology was introduced as an ESC course.

  
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In the VIth Semester, Biokinetics and Biotransformation was introduced as a PCC course and Biokinetics lab introduced as a PCCI course. Under the Professional Elective Course, Synthetic Biology was introduced along with Tissue Engineering and Bio Printing Technology. Modelling and Simulations in Biology was introduced as an AEC lab component.

In the VIIth semester, Metabolic Engineering and Biopharmaceuticals, Environmental BT, Agricultural BT and Biological Data Management were included as Professional Elective Courses.

The contents of some of the PCC courses were discussed and the further refinement of syllabus was requested by the Chairman.

The Workshops for some of the subjects were discussed, specifically Biology for Engineers where members thought a module on Basic Biology be introduced.

The meeting ended with the Chairman thanking all members and special invitees for their time and suggestions.

Kindly find the following enclosures

1. Notice on BoS meeting held on 18<sup>th</sup> May 2023 with External invited Industrial experts.
2. Minutes of meeting of BoS meeting held on 18<sup>th</sup> May 2023 with External invited Industrial experts.
3. Syllabus of BIOLOGY FOR ENGINEERS BBOK407 for all Engineering streams (file name: 14\_BBOK407\_BSC\_3CR\_BIOENG)
4. Draft BoS Scheme and syllabus (In individual course wise files) of scheme 2022-2023 from 3<sup>rd</sup> to 8<sup>th</sup> semester UG Biotechnology for your approval.

*Krishna Prasad XI.*

Dr. Krishna Prasad Nooralabettu  
BOS CHAIRMAN, BIOTECHNOLOGY BOARD

  
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("ವಿ ಬಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)



# VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994) "Jnana Sangama" Belagavi-590018, Karnataka, India

**Prof. B. E. Rangaswamy, Ph.D.**  
REGISTRAR

Phone: (0831) 2498100  
Fax: (0831) 2405467

REF: VTU/BGM/BOS/AEC2021/2023-24/ 3844 DATE:

6 NOV 2023

## CIRCULAR

**Subject:** 21CSL581 and 21CSL582 change of theory courses as practical courses regarding...

**Reference:** Chairperson's Board of Studies in CSE VTU Belagavi suggestions dated 31.10.2023  
The Hon'ble Vice-Chancellor's approval dated 06.11.2023

The courses **Angular JS and Node JS (21CSL581)** and **C# and .Net Framework (21CSL582)** were practical according to the course code in the 2021 scheme; nevertheless, the L:T:P indicator showed it as 1:0:0 and the syllabus content was in the form of modules. The clarification for this issue was raised by a few of the colleges that were referred to the present Board of Studies in CSE for clarification.

The course title has been changed to **Angular JS** because, although Node JS and Angular JS are parallel technologies, BoS felt that students might study any one of them. Theory course for C# and the .NET Framework while transitioning to a practical course BoS believed that courses on **C# programming** were better suited as practical courses, thus theory modules were changed to reflect this.

These courses are also available with course codes **21CBL583** and **21CBL584**, respectively, for the **Computer Science and Business Systems (CSBS)** program.

All the principals of engineering colleges are hereby informed to bring the content of the circular and change of theory courses into the practical course for CSE and CSBS programs to the notice of all concerned.

Sd/-  
REGISTRAR

To,

- Principals of all engineering colleges under the ambit of the university
- Chairpersons of the university departments at Kalaburgi, Belagavi, Bengaluru and Mysuru

Copy to

- The Hon'ble Vice-Chancellor through the Secretary to VC for information
- The Registrar (Evaluation) for information and needful

  
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- The Director, ITI SMU, VTU Belagavi for information and make arrangements for uploading the notification on the VTU web portal.
- The Chairperson and Members BoS in CSE VTU Belagavi for information
- The Special Officer and Caseworker of QPDS, Examination section VTU Belagavi for information and needful
- The office copy

Rg 06/11/23 BE  
REGISTRAR  
7/6/11



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## Semester -V

| C# PROGRAMMING  |  |             |     |
|---|--|-------------|-----|
| Course Code   | 21CSL582/ 21CBL584   | CIE Marks   | 50  |
| Teaching Hours/Week (L:T:P: S)  | 0:0:2:0/ 24 Hours  | SEE Marks   | 50  |
| Credits   | 01   | Total marks | 100 |
| Examination type (SEE)  | PRACTICAL  |             |     |
| <b>Course objectives:</b> <ul style="list-style-type: none"><li>• To learn basic features of C# programming</li><li>• To understand C# support for OOP with programming examples</li><li>• To gain experience of modern tool usage (VS Code, Visual Studio or any other] in developing C# programs</li></ul>  |  |             |     |
| Sl.NO   | Experiments  |             |     |
| 1   | Develop a C# program to simulate simple arithmetic calculator for Addition, Subtraction, Multiplication, Division and Mod operations. Read the operator and operands through console.  |             |     |
| 2   | Develop a C# program to print Armstrong Number between 1 to 1000.  |             |     |
| 3   | Develop a C# program to list all substrings in a given string. [ Hint: use of Substring() method]  |             |     |
| 4   | Develop a C# program to demonstrate Division by Zero and Index Out of Range exceptions.  |             |     |
| 5   | Develop a C# program to generate and printPascal Triangle using Two Dimensional arrays.  |             |     |
| 6   | Develop a C# program to generate and print Floyds Triangle using Jagged arrays.  |             |     |
| 7   | Develop a C# program to read a text file and copy the file contents to another text file.  |             |     |
| 8   | Develop a C# C# Program to Implement Stack with Push and Pop Operations [Hint: Use class, get/set properties, methods for push and pop and main method]  |             |     |
| 9   | Design a class "Complex" with data members, constructor and method for overloading a binary operator '+'. Develop a C# program to read Two complex number and Print the results of addition.   |             |     |
| 10  | Develop a C# program to create a class named shape. Create three sub classes namely: circle, triangle and square, each class has two member functions named draw () and erase (). Demonstrate polymorphism concepts by developing suitable methods, defining member data and main program. |             |     |
| 11  | Develop a C# program to create an abstract class Shape with abstract methods calculateArea() and calculatePerimeter(). Create subclasses Circle and Triangle that extend the Shape class and implement the respective methods to calculate the area and perimeter of each shape.           |             |     |
| 12  | Develop a C# program to create an interface Resizable with methods resizeWidth(int width) and resizeHeight(int height) that allow an object to be resized. Create a class Rectangle that implements the Resizable interface and implements the resize methods                              |             |     |
| <b>Course outcomes (Course Skill Set):</b><br>At the end of the course the student will be able to: <ul style="list-style-type: none"><li>1. Develop programs involving basic features of C# programming language</li><li>2. Make use of exception handling features to safeguard program against runtime anomalies</li><li>3. Apply concepts of OOP in developing solutions to problems</li><li>4. Develop programs to illustrate handling of text files</li><li>5. Make use of modern tools to develop C# programs and applications</li></ul> |  |             |     |



Semester -V

**Suggested Learning Resources:**

**Textbooks**

1. ShyamSeshadri, Brad Green —“AngularJS: Up and Running: Enhanced Productivity with Structured Web Apps”, Apress, O'Reilly Media, Inc.
2. AgusKurniawan—“AngularJS Programming by Example”, First Edition, PE Press, 2014

**Weblinks and Video Lectures (e-Resources):**

1. Introduction to Angular JS :<https://www.youtube.com/watch?v=HEbphzK-0xE>
2. Angular JS Modules :<https://www.youtube.com/watch?v=gWm0KmgnQkU>
3. <https://www.youtube.com/watch?v=zKkUN-mJtPQ>
4. [https://www.youtube.com/watch?v=IC17\\_i2mtZA](https://www.youtube.com/watch?v=IC17_i2mtZA)
5. [https://www.youtube.com/watch?v=Y2Few\\_nkze0](https://www.youtube.com/watch?v=Y2Few_nkze0)
6. <https://www.youtube.com/watch?v=QoptnVCQHsU>

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

- Demonstration of simple projects/applications (course project)



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## Semester -V

### Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the **maximum** marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each course. The student has to secure not less than 35% (18 Marks out of 50) in the semester-end examination (SEE). The student has to secure a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

### Continuous Internal Evaluation (CIE):

CIE marks for the practical course is **50 Marks**.

The split-up of CIE marks for record/ journal and test are in the ratio **60:40**.

- Each experiment to be evaluated for conduction with observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments designed by the faculty who is handling the laboratory session and is made known to students at the beginning of the practical session.
- Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks.
- Total marks scored by the students are scaled down to 30 marks (60% of maximum marks).
- Weightage to be given for neatness and submission of record/write-up on time.
- Department shall conduct 02 tests for 100 marks, the first test shall be conducted after the 8<sup>th</sup> week of the semester and the second test shall be conducted after the 14<sup>th</sup> week of the semester.
- In each test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.
- The suitable rubrics can be designed to evaluate each student's performance and learning ability. Rubrics suggested in Annexure-II of Regulation book
- The average of 02 tests is scaled down to **20 marks** (40% of the maximum marks).

The Sum of scaled-down marks scored in the report write-up/journal and average marks of two tests is the total CIE marks scored by the student.

### Semester End Evaluation (SEE):

- SEE marks for the practical course is 50 Marks.
  - SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by the University
  - All laboratory experiments are to be included for practical examination.
  - (Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. OR based on the course requirement evaluation rubrics shall be decided jointly by examiners.
  - Students can pick one question (experiment) from the questions lot prepared by the internal/external examiners jointly.
  - Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.
  - General rubrics suggested for SEE are mentioned here, write up -20%, Conduction procedure and result in - 60%, Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)
  - The duration of SEE is 02 hours
- Rubrics suggested in Annexure-II of Regulation book



## Semester -V

| ANGULAR JS  |  |             |     |
|---|--|-------------|-----|
| Course Code   | 21CSL581/ 21CBL583   | CIE Marks   | 50  |
| Teaching Hours/Week (L:T:P: S)  | 0:0:2:0  | SEE Marks   | 50  |
| Credits   | 01   | Total marks | 100 |
| Examination type (SEE)  | PRACTICAL  |             |     |
| <b>Course objectives:</b> <ul style="list-style-type: none"><li>• To learn the basics of Angular JS framework.</li><li>• To understand the Angular JS Modules, Forms, inputs, expression, data bindings and Filters</li><li>• To gain experience of modern tool usage (VS Code, Atom or any other] in developing Web applications</li></ul>   |  |             |     |
| Sl.NO   | Experiments  |             |     |
| 1   | Develop Angular JS program that allows user to input their first name and last name and display their full name. <b>Note:</b> The default values for first name and last name may be included in the program.  |             |     |
| 2   | Develop an Angular JS application that displays a list of shopping items. Allow users to add and remove items from the list using directives and controllers. <b>Note:</b> The default values of items may be included in the program.   |             |     |
| 3   | Develop a simple Angular JS calculator application that can perform basic mathematical operations (addition, subtraction, multiplication, division) based on user input.   |             |     |
| 4   | Write an Angular JS application that can calculate factorial and compute square based on given user input.   |             |     |
| 5   | Develop AngularJS application that displays a details of students and their CGPA. Allow users to read the number of students and display the count. <b>Note:</b> Student details may be included in the program.   |             |     |
| 6   | Develop an AngularJS program to create a simple to-do list application. Allow users to add, edit, and delete tasks. <b>Note:</b> The default values for tasks may be included in the program.  |             |     |
| 7   | Write an AngularJS program to create a simple CRUD application (Create, Read, Update, and Delete) for managing users.  |             |     |
| 8   | Develop AngularJS program to create a login form, with validation for the username and password fields.  |             |     |
| 9   | Create an AngularJS application that displays a list of employees and their salaries. Allow users to search for employees by name and salary. <b>Note:</b> Employee details may be included in the program.  |             |     |
| 10  | Create AngularJS application that allows users to maintain a collection of items. The application should display the current total number of items, and this count should automatically update as items are added or removed. Users should be able to add items to the collection and remove them as needed. <b>Note:</b> The default values for items may be included in the program. |             |     |
| 11  | Create AngularJS application to convert student details to Uppercase using angular filters. <b>Note:</b> The default details of students may be included in the program.   |             |     |
| 12  | Create an AngularJS application that displays the date by using date filter parameters   |             |     |
| <b>NOTE:</b> Include necessary HTML elements and CSS for the above Angular applications.  |  |             |     |
| <b>Course outcomes (Course Skill Set):</b><br>At the end of the course the student will be able to: <ul style="list-style-type: none"><li>1. Develop Angular JS programs using basic features</li><li>2. Develop dynamic Web applications using AngularJS modules</li><li>3. Make use of form validations and controls for interactive applications</li><li>4. Apply the concepts of Expressions, data bindings and filters in developing Angular JS programs</li><li>5. Make use of modern tools to develop Web applications</li></ul> |  |             |     |



## Semester -V

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### Continuous Internal Evaluation (CIE):

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- Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10marks.
- Total marks scored by the students are scaled down to 30 marks (60% of maximum marks).
- Weightage to be given for neatness and submission of record/write-up ontime.
- Department shall conduct 02 tests for 100 marks, the first test shall be conducted after the 8<sup>th</sup> week of the semester and the second test shall be conducted after the 14<sup>th</sup> week of the semester.
- In each test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.
- The suitable rubrics can be designed to evaluate each student's performance and learning ability. Rubrics suggested in Annexure-II of Regulation book
- The average of 02 tests is scaled down to **20 marks** (40% of the **maximum** marks).

The Sum of scaled-down marks scored in the report write-up/journal and average marks of two tests is the

### Semester End Evaluation (SEE):

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  - Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.
  - General rubrics suggested for SEE are mentioned here, write up -20%, Conduction procedure and result in -60%, Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)
  - The duration of SEE is 02hours
- Rubrics suggested in Annexure-II of Regulation book

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Semester -V

**Suggested Learning Resources:**

**Textbooks**

1. Herbert Schildt, "The Complete Reference: C# 4.0", Tata McGraw Hill, 2012
2. Andrew Troelsen, "Pro C# 2010 and the .NET 4 Platform, Fifth edition, A Press, 2010.

**Weblinks and Video Lectures (e-Resources):**

1. Introduction to C#: <https://www.youtube.com/watch?v=ItoIFCT9P90>
2. .NET FRAMEWORK: <https://www.youtube.com/watch?v=h7huHkvPoEE>
3. <https://www.tutorialsteacher.com/csharp>
4. <https://www.w3schools.com/cs/index.php>
5. <https://www.javatpoint.com/net-framework>

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

- Demonstration of simple projects (course project)

  
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