Sikkim Manipal University
Directorate of Distance Education

MBT 405 – Project Guidelines

Master of Science in Biotechnology (M.Sc. BT) – Revised: Fall 2010

Department of Healthcare Sciences
Directorate of Distance Education, Sikkim Manipal University

Contents

1. Introduction

M.Sc. Biotechnology students will have to carry out a compulsory Project work as a part of the curriculum in 4th semester subject MBT 405 to fulfil the requirement of the Program. Project Work is the best way to practice what you have learnt. The purpose of including Project in the M.Sc. Biotechnology Programme is to provide you an opportunity to investigate a problem applying Biotechnology concepts in a scientific manner. It enables you to apply your conceptual knowledge in a practical situation and to learn the art of conducting a study in a systematic way and presenting its findings in a coherent report. How well you collect, synthesize and make the data meaningful is what you learn through this process. The candidate has to identify the research topic, a mentor who is familiar with their prospective inquiry and an institution, where he/she proposes to work and obtain necessary permission or approval from that organization. After obtaining approval letter, the candidate has to start working on the Project.

The research work can be carried out by the candidate from any of the following institutions:

- Research Institutes/ Universities/colleges
- Pharma or Biotechnology companies/labs
- Hospitals

All communications regarding Projects should be addressed to projects.ahs@smudde.edu.in. In the subject component of the mail, mention “MSc BT Project-Request for.....……..”.

Objectives:

After the completion of this Project work, you should be able to:

- identify research problem
- apply the theoretical and practical knowledge acquired in the previous semesters
- analyse and interpret the data collected from the research work
- formulate the Project report.

2. Project Work

The Project work constitutes a major component in most post graduate programs. It needs to be carried out with due care, and should be executed with seriousness by the students. The Project work is not only a partial fulfilment of the MSc requirements, but also provides a mechanism to demonstrate your skills, abilities and specialization.

2.1 Eligibility Criteria and Roles of the Project Guide

The role of a Project guide is highly significant in getting a quality output from the students. He should have expertise in the subject domain. He is responsible for counselling, monitoring and evaluating student’s research work.

2.1.1 Qualification of a Guide

- A Post Graduate in Biotechnology/Life Sciences with specialization in biotechnology.
- The guide should have a minimum of 5 years of Industry/ Teaching experience.
- Each guide can supervise up to maximum of 10 Projects in a given session.

2.1.2 Roles of a Guide

Following are the roles of a Project guide:

1. In the beginning of the Project work, Project guide is expected to offer guidance to students in identification of research problem, to fine tune the identified research problem, and in synopsis preparation.
2. During the course of the Project work, the Project guide has to monitor and review the Project work periodically. Project guide is expected to do minimum two reviews during the course of the Project and submit ***Project review report*** (Annexure-III) in a prescribed format to the Learning Centre (LC) in a sealed cover through student during the Project report submission.
3. During the finalization of the Project report, the Project guide has to go through the draft Project report and offer suggestions wherever necessary and ensure that the Project report is submitted as per the prescribed format.
4. After the successful completion of the Project work, the Project guide has to submit the ***Internal Assessment (IA) marks*** (Annexure-V) of the students whom he has guided in a given session in a prescribed format, to the Learning Centre to which the students belong. After necessary verification, Project guide has to sign the final Project report and facilitate the submission of signed Project report to Learning centre through student.

2.2 Guidelines to Apply for Project Guideship

- The aspirants seeking guideship could directly apply to the SMU-DDE, in the prescribed format available on the University website / EduNxt Portal (see Annexure II) or Students can identify the prospective guide and get the 'Project Guide Registration Form' (Annexure II) filled and duly signed by prospective guide.
- Along with duly filled in Project Guide Registration Form' enclose CV, attested photocopies of all the essential educational qualifications and photocopy of published research article if any, and are submitted to the University.

2.3 Roles of the University Project Steering Committee

A University Project Steering Committee (PSC) has been setup at the University to monitor the quality of the Projects prepared by students. The roles of this committee include:

- Coordination and tracking of all the Project related activities.
- Approval of the ***Project guide*** after verification of documents pertaining to their qualification.
- Review of synopsis and approval in case it is as per the requirement. If the synopsis is not as per requirement, provide necessary suggestions to students to reformulate the synopsis.

Communication to students and learning centre regarding the acceptance of Project Synopsis or modifications needed to meet the actual requirement.

3. Phases of Project Work

Project work consists of two phases. Phase -1: Project Synopsis and Guide Approval, Phase -2: Project Design and Development (refer figure 1).

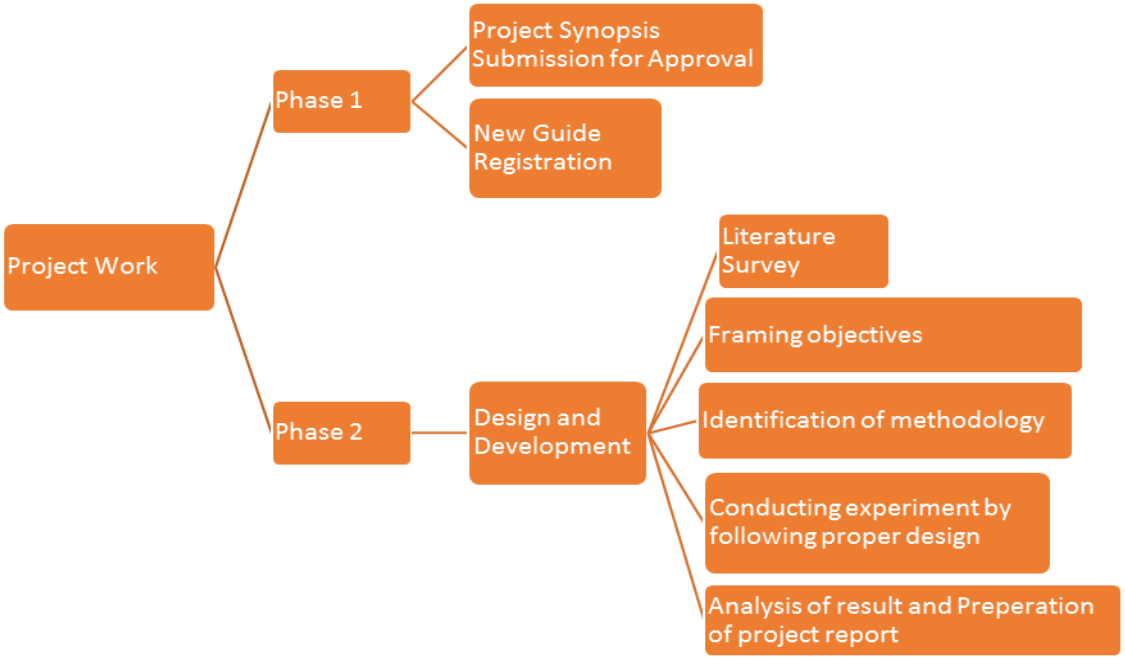


Fig. 1: Project work- Phases

3.1 Phase - 1: Project Synopsis and Guide Approval

Project Synopsis Submission for Approval: The student needs to submit the Project synopsis for approval through EduNxt portal. The Project synopsis should be prepared in consultation with your guide. The template given in Annexure-I (also downloadable from EduNxt) is to be used. Your guide should approve the Project Synopsis. The Project synopsis should contain the clear statement about the Project, the resource requirements of the proposed Project and place where it is conducted. This should be submitted along with the Guide Acceptance letter. Project Synopsis may be disqualified if it is prepared without the Guide's Signature. Refer to figure 2 for details of the activities involved in this stage.

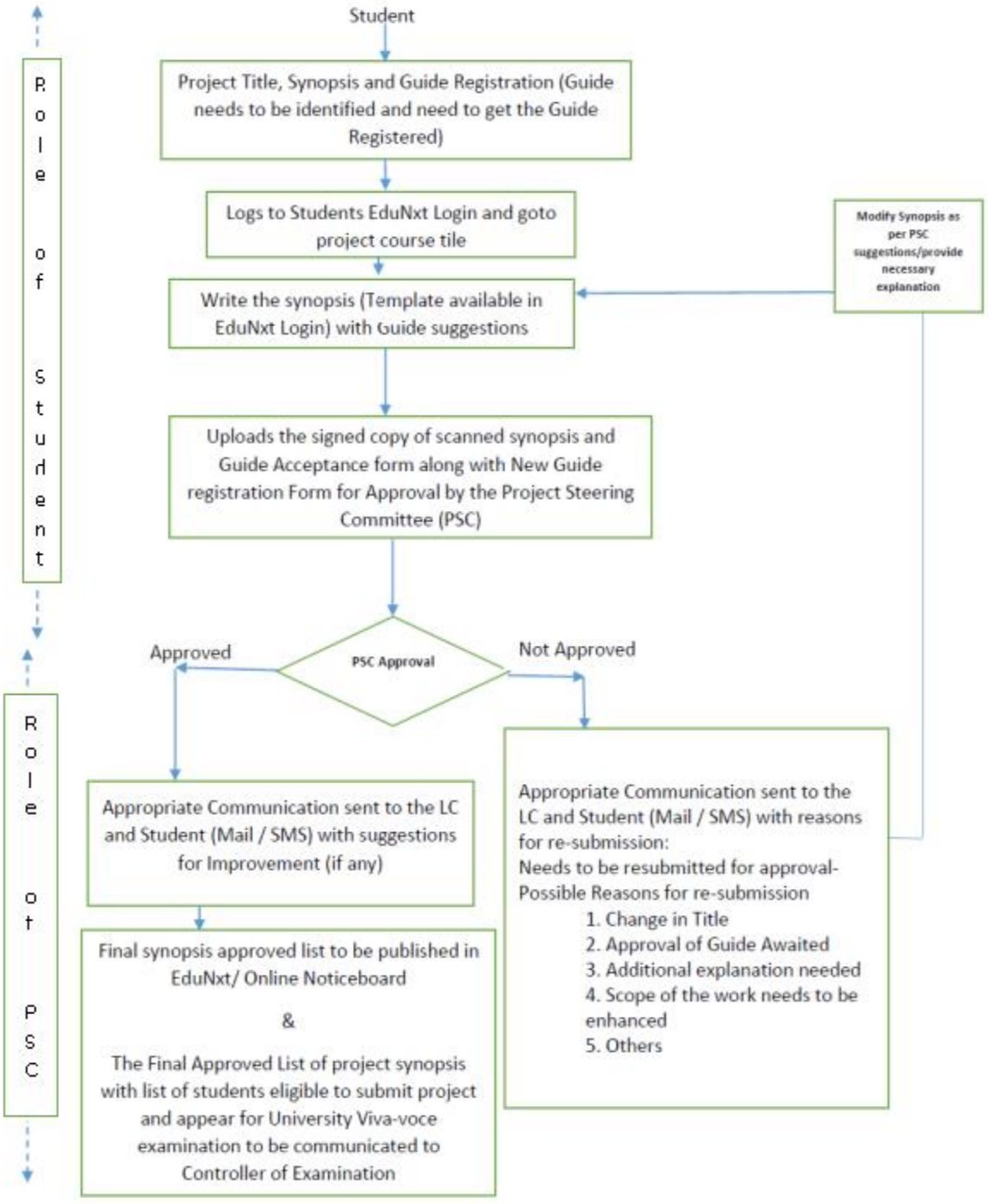


Fig. 2: Phase -1: Project Synopsis preparation and submission for approval

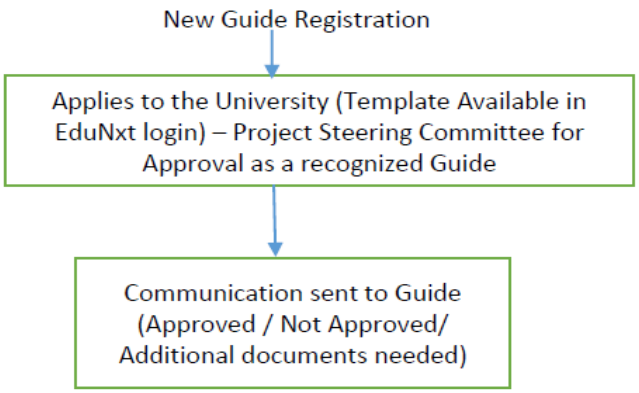


Fig. 3: Phase -1: New Guide Registration

New Guide Registration: The Guide to be identified by the student and need to be registered with SMU-DE in the prescribed format given in Annexure-II (also downloadable from EduNxt). This is the one time process. The guide details and his/her credentials to be forwarded along with the Project synopsis by the student to the Project steering committee for New Guide Registration. Refer to figure 3 for details of the activities involved in this stage.

All submitted Project synopsis will be processed by the Project Steering Committee. The status of Project synopsis approval will be informed to the student, Guide and LC through the e-mail. Once approved, the student can proceed to phase 2. Or, the student needs to work on the Project synopsis for resubmission, in accordance with the reason specified on the mail for rejection. The deadlines for Project synopsis submission / Guide Registration for your session please visit EduNxt portal or University website.

3.2 Phase – 2: Project Design and Development

Project Development includes Identification of research problem, literature survey, framing objectives, identification of suitable methodology, conducting experiment by following proper design, analysis of result and preparation of Project Report. Refer to figure 4 for details of the activities involved in this Phase.

A. **Identification of research problem:** A research problem, or phenomenon is a topic you would like to address, investigate, or study, whether descriptively or experimentally. You have to identify topic, phenomenon, or challenge that you are interested in and with which you are at least somewhat familiar.
B. **Literature Survey:** It is a method of documentation of comprehensive review of published or unpublished work from secondary sources of data in the areas of specific interest to the

researcher. Following are the basic purpose of literature survey:

1. Provide a context for the research
2. Justify the research
3. Ensure the research hasn't been done before (or that it is not just a "replication study")
4. Show where the research fits into the existing body of knowledge
5. Enable the researcher to learn from previous theory on the subject
6. Illustrate how the subject has been studied previously
7. Highlight flaws in previous research
8. Outline gaps in previous research
9. Show that the work is adding to the understanding and knowledge of the field
10. Help refine, refocus or even change the topic

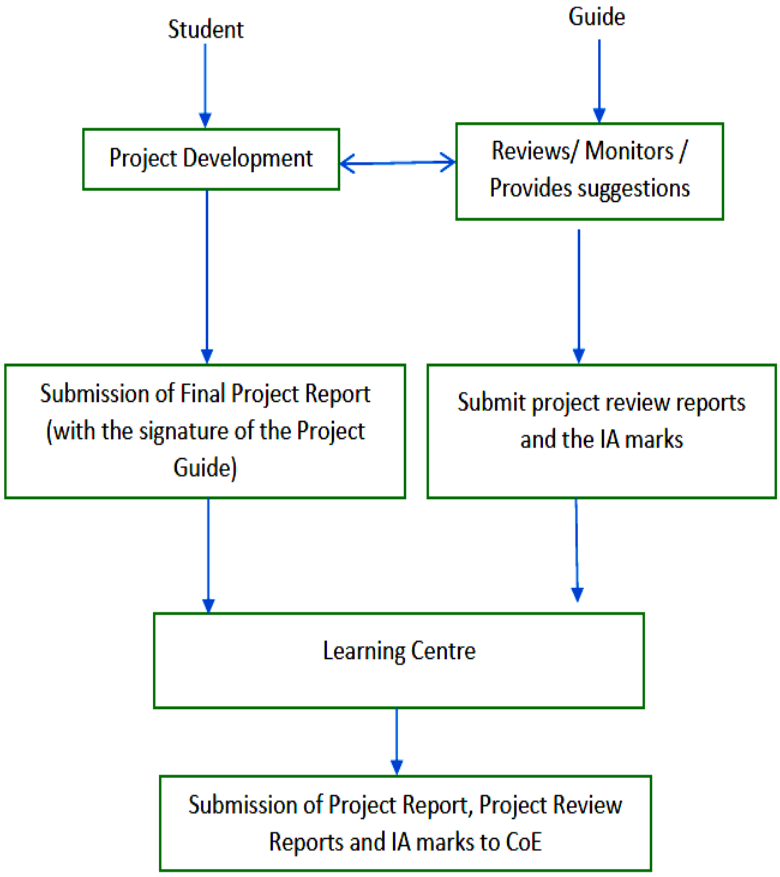


Fig. 4: Phase -2: Project Design and Development

C. Framing Objectives: A research objective is a statement identifying main focus/foci of study and general research boundaries**.** This has to be done after formulating good research problem. Objectives help us to complete the research work in an organized way.

D. Identification of suitable methodology: To achieve the set of objectives framed, suitable

methodologies have to be adopted. Identification of suitable methods can be done based on the literature survey. It involves (a) design, (b) sampling, (c) tools and techniques and (d) processing and analysis of data. These aspects are explained below.

a) **Design:** This is a process of planning a study to meet specified objectives.
b) **Sampling:** This is a method of selecting a specific object, events or respondents used in the study.
c) **Tools/ Techniques:** These are instruments, devices, material or techniques used in the collection of data.
d) **Processing and analysing data**: These are the techniques used to process the collected data and analyse them to answer the research problem.

E. Conducting experiment: An experiment is typically carried out by manipulating a variable, called the independent variable, affecting the experimental group. The effect that the researcher is interested in, the dependent variable(s), is measured. Identifying and controlling non-experimental factors which the researcher does not want to influence the effects, is crucial for drawing a valid conclusion. This is often done by controlling variables, if possible, or randomizing variables to minimize effects that can be traced back to third group of variables. Researchers only want to measure the effect of the independent variable(s) when conducting an experiment, allowing them to conclude that this was the reason for the effect.

F. Analysis of result: The observation from the experiment results in formation of raw data. The arrangement of raw data results in "output data". The output data is used for statistical analysis. This is helpful in drawing conclusion, together with other observations.

G. Preparation of Project report: On completion of the Project, the student has to prepare the final Project report. The entire Project work is to be documented as the Project Report. The guidelines for Project report preparation is given in section 5 of this document.

4. Broad Areas for Project Work

Following is a list of areas considered suitable for the Project. These are only broad outline and specifics may be decided in consultation with the Project guide at the place where the Project will be completed.

1. Biodegradation of Organic Waste
2. Microbial fermentation
3. Microbial plant inoculants
4. Isolation of bacterial gene
5. Antioxidants from plants
6. Extraction and isolation of algal pigments
7. Extraction and characterization of amylases
8. Biodiesel

9. Probiotics
10. Vermicomposting
11. Plant tissue culture
12. Transformation in plants and microbes
13. Domestic Waste Water Treatment
14. Characterization of soil microorganisms
15. Isolation and characterization of proteins
16. Isolation and Identification of Fungal Pathogens of plant origin
17. Natural preservatives
18. Chemical and Biochemical Evaluation of Plant Extracts
19. Microbial biocontrol agents
20. Microbial insecticides
21. Plant Growth Promoting Microorganisms
22. Bacteriostatic / Fungistatic analysis of drugs of plant origin
23. Isolation and characterization of Industrially Important Micro-organisms
24. Isolation and screening of agriculturally important microbes
25. Designing a primer for cancer causing genes and PCR standardization

5. Guidelines for Preparation of Final Project Report

Following are the guidelines for the preparation of final Project report:

A. The length of the report may be about 70 pages or not exceeding approximately 18,000 words (excluding Tables, plates {i.e., photographs} and figures). However, 10% variation on either side is permissible. Formatting details are as follows:
   (i) Line spacing: 1.2 line spacing
   (ii) Margin: 1.25 inches margin on either side
   (iii) Font: Times New Roman font with Font size 16 and Bold for Chapter names, 14 and Bold for headings and 12 for content.
   (iv) Paper: Project report should be printed on A4 size papers.

B. The Project Report should be hard bound. The signatures of both student and Guide should be present wherever applicable.

C. Tables, plates (i.e., photographs) and figures included in the Project report should be numbered and must contain titles. They should be referred in the text.

D. Project report must contain:
   1. Cover Page and Title Page (Refer Annexure IV A)
   2. Bonafide Certificate (Refer Annexure IV B)
   3. Abstract
   4. Table of Contents(Refer Annexure IV C)

5. List of Tables (Refer Annexure IV D)
6. List of Figures (Refer Annexure IV E)
7. List of Plates {i.e., photographs} (Refer Annexure IVF)
8. Chapter 1 - Introduction: An Introduction section should describe the background of the Project and the question or hypothesis that the research hopes to answer. At the end of the Introduction, you have to mention the objective of the study.
9. Chapter 2 - Review of Literature: This is a report of information found in the literature related to your selected area of study.
10. Chapter 3 - Materials and Methods: This chapter describes the steps of your experiment with enough detail that another scientist (i.e. another member of the class) could reproduce the experiment without asking you for further clarification.
11. Chapter 4 - Results and Discussion: This section of the write-up will show the actual data you obtained. The data should be organized in a table and a graph so that, a reader can easily see whether the hypothesis is supported or nullified.
12. Chapter 5 - Summary: A summary is condensed version of the outcome of a research.
13. References/Bibliography: The References should be in American Psychological Association (APA) format. Maintain single-space within a reference and double-space between them (Refer Annexure –IV G for details).

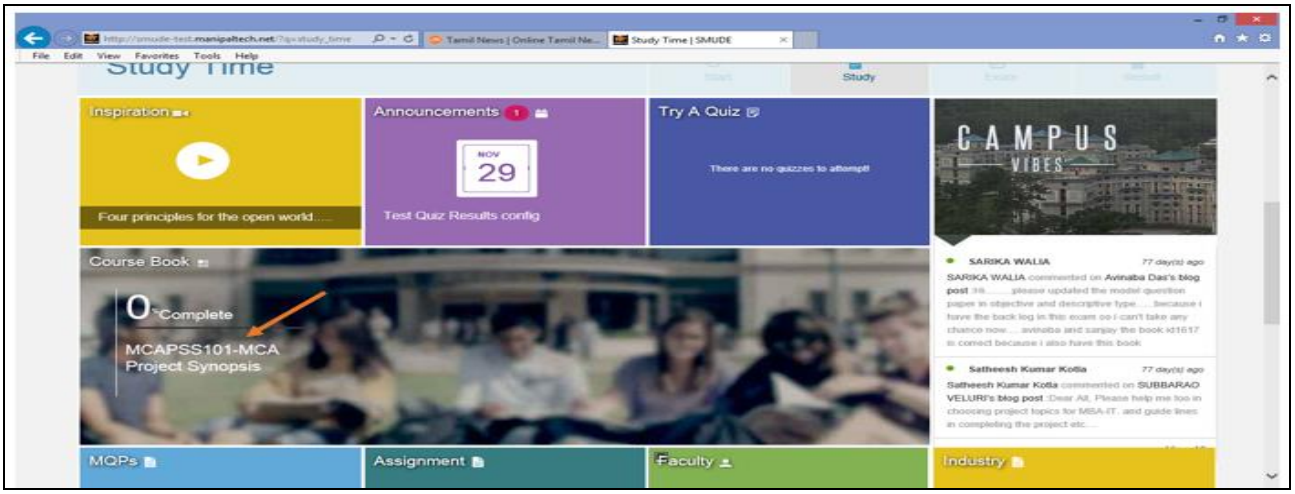
E. Content of the Project report should be well organized in a meaningful manner and all pages of report should be numbered. The Project report should be hard bound and printouts of text and photographs should be original (not photocopied).

F. If any Project report is received in the absence of the items listed above, it will be considered as violation of Project guidelines. Violation of Project Guidelines may lead to rejection of the Project.

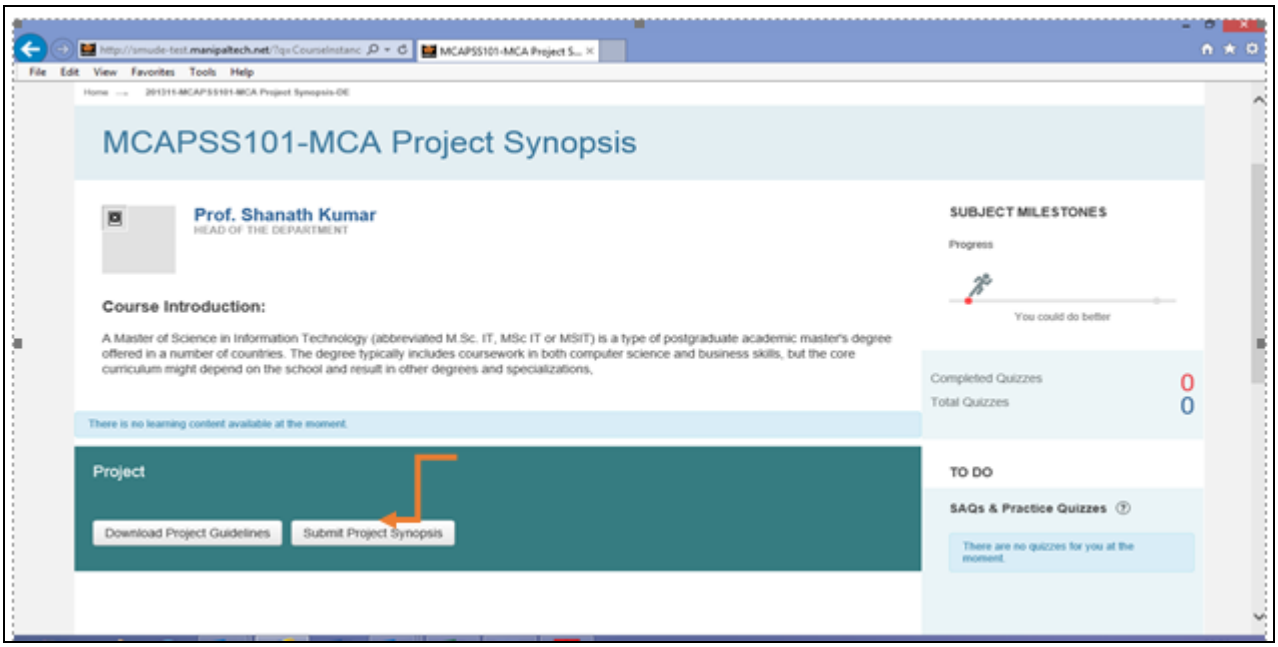
6. Project Synopsis Submission using EduNxt

Step 1: Go to the EduNxt URL (http://edunxt.smude.edu.in) and enter your user-id and password.

Step 2: Go to Project Tile (for example “MCAPSS101-MCA Project Synopsis”) and click on it to enter to the Project synopsis submission page.



Step 3: Click on “Submit Project Synopsis”

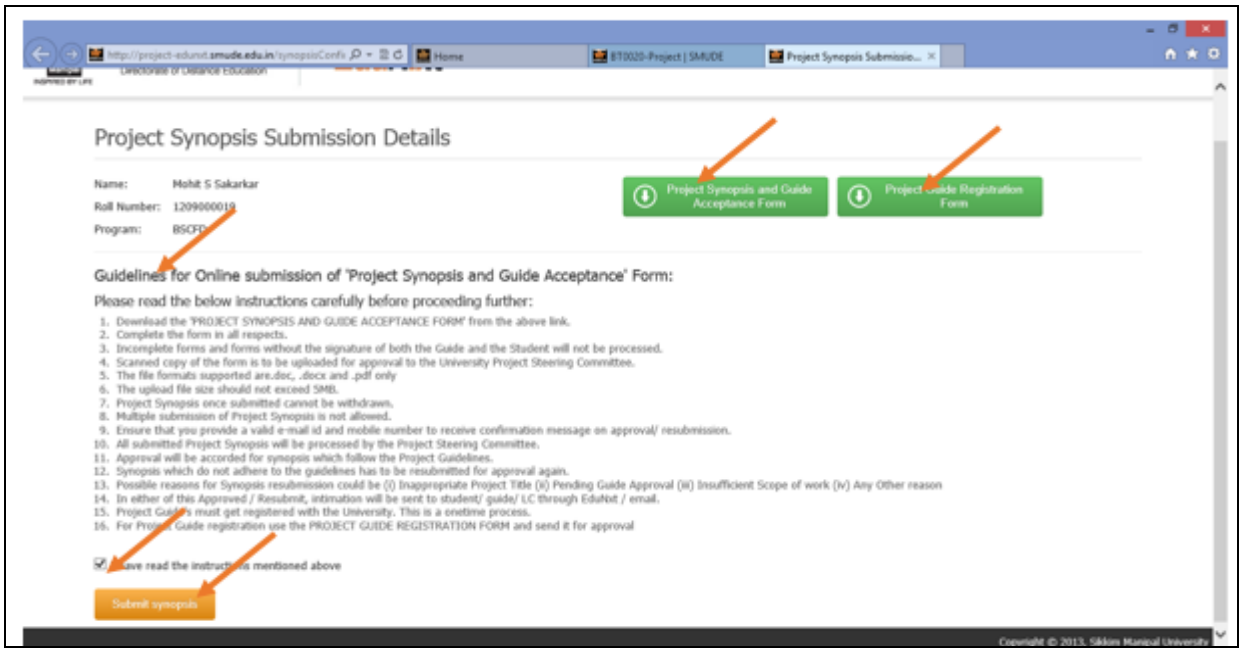


Step 4: (i) Read the Guidelines carefully before filling the form.

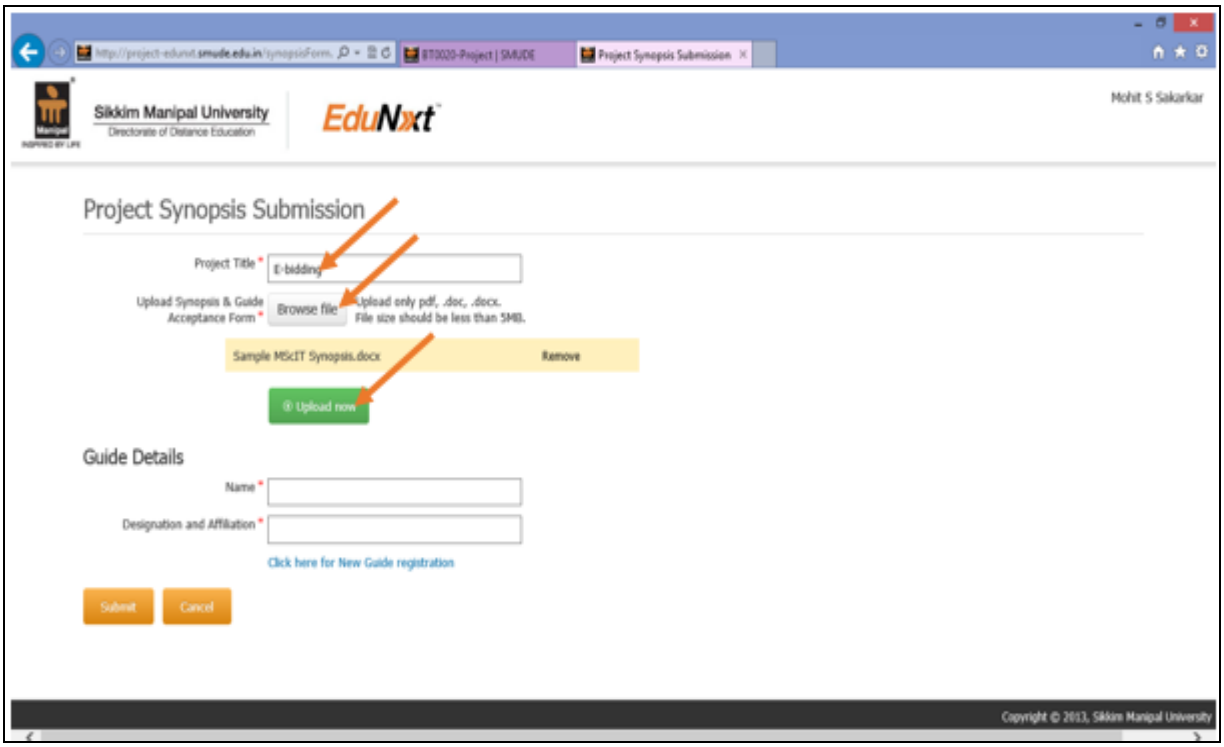
(ii) Download the “Project Synopsis Submission and Guide Acceptance Form” for Project Synopsis Submission (or see Annexure I) or “Project Guide Registration form” for New Project Guide Approval (or see Annexure II).

(iii) Make your Project Synopsis ready for upload. (Fill the form in all aspects, scan and convert your document in to either .doc or .pdf file)

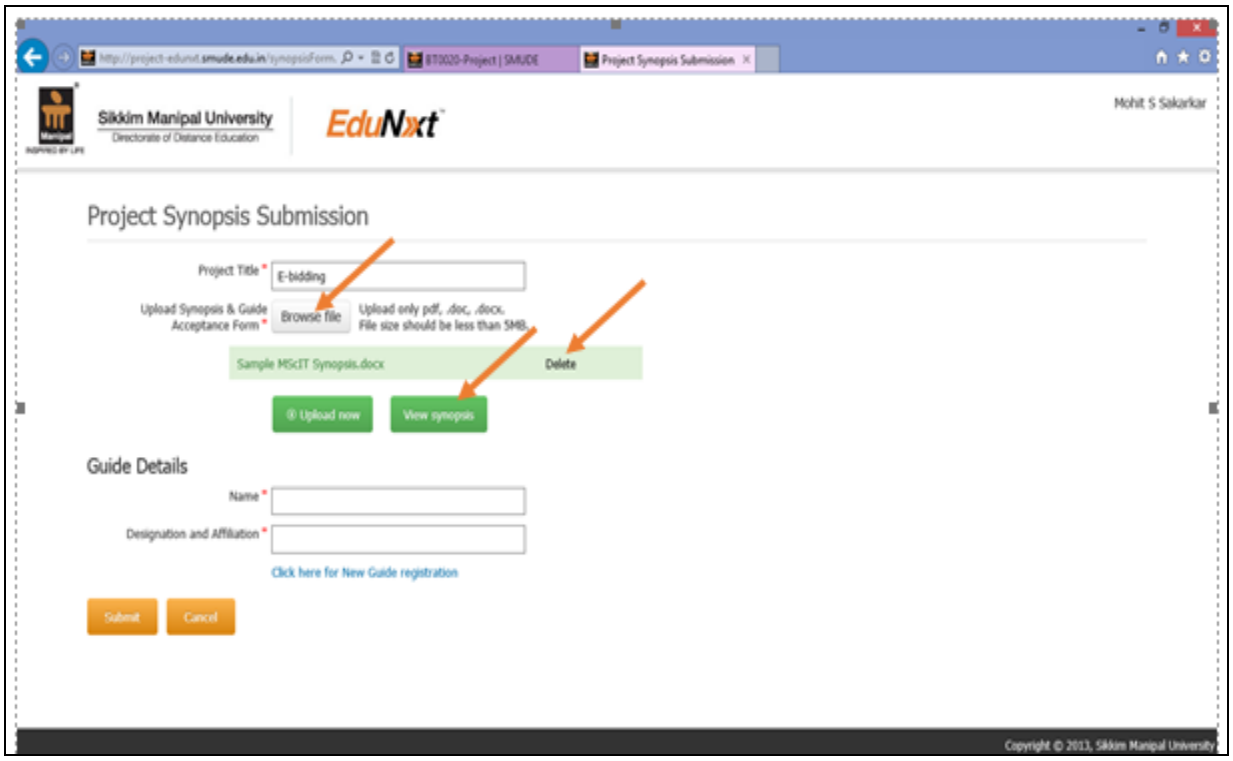
(iv) Select the checkbox and click on “submit synopsis” button.



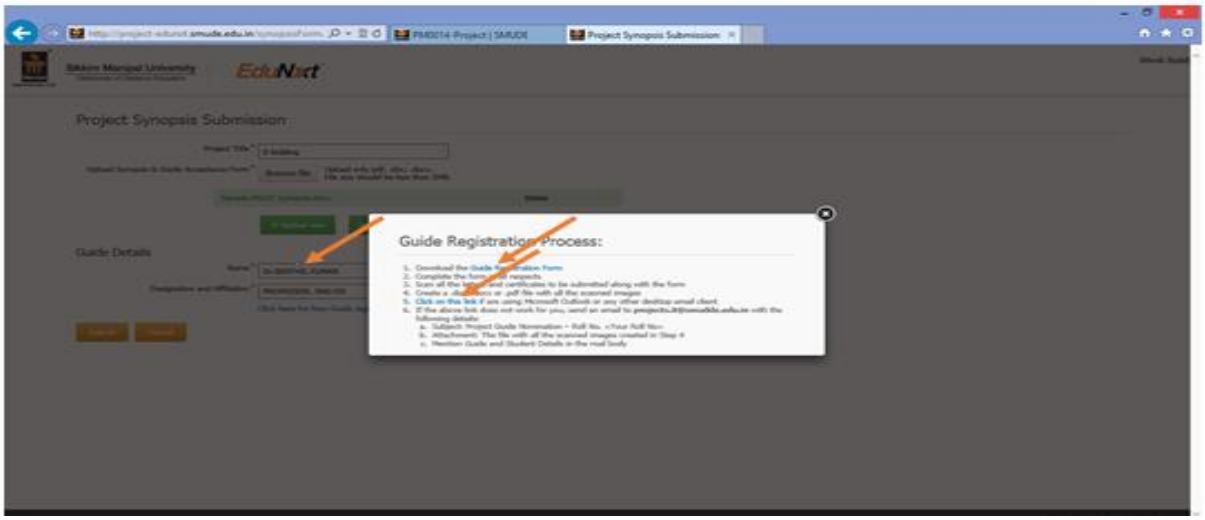
Step 5: Fill the Project Synopsis details, Select the scanned file by using “browse file” option. (Note: It accepts only .doc, .docx and .pdf formats). Upload your file by clicking on “Upload now” button.



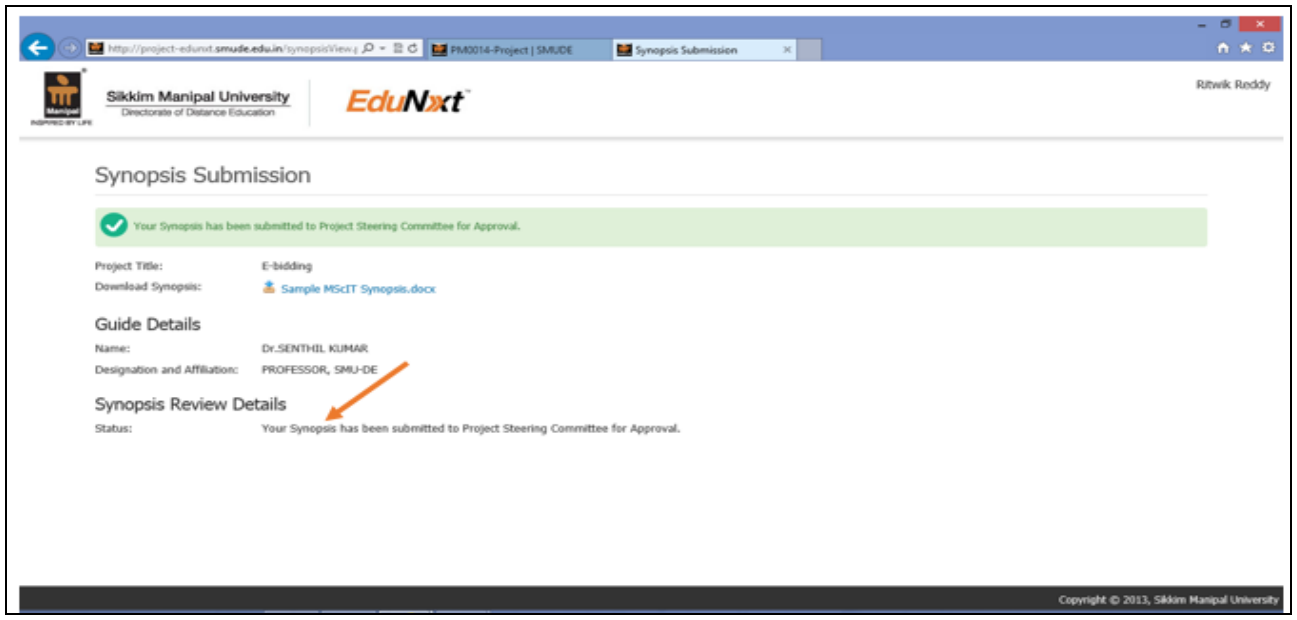
Step 6: if you want to see the file which you have uploaded, click on "view synopsis" button. Further if you want to edit/delete the uploaded file, Delete the file by clicking "delete" option and upload the latest file by using "browse file" option.



Step 7: Fill the Guide Details and click on "Click here for New guide registration" for forwarding Guide registration form (Download the form, which is available in Guidelines page or click on "Guide Registration form") along with his/her credentials to the Project steering committee for approval through e-mail.

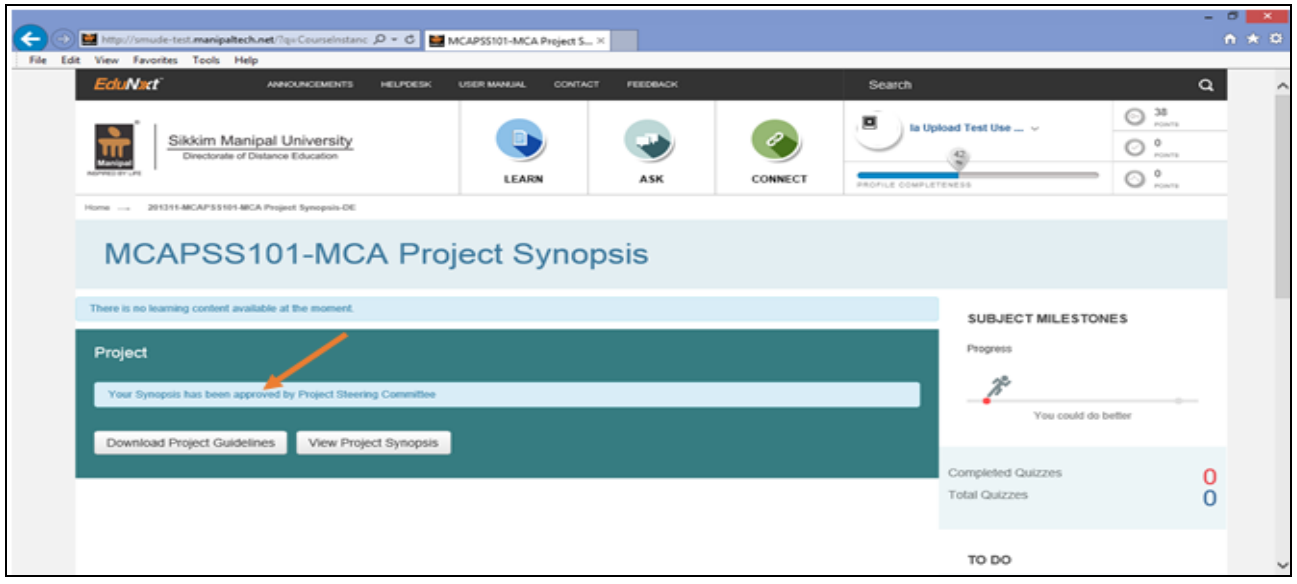


Step 8: Once Project synopsis and guide details are uploaded, click on "submit" button. On successful submission, your status will show as "your synopsis has been submitted to Project steering committee for Approval".

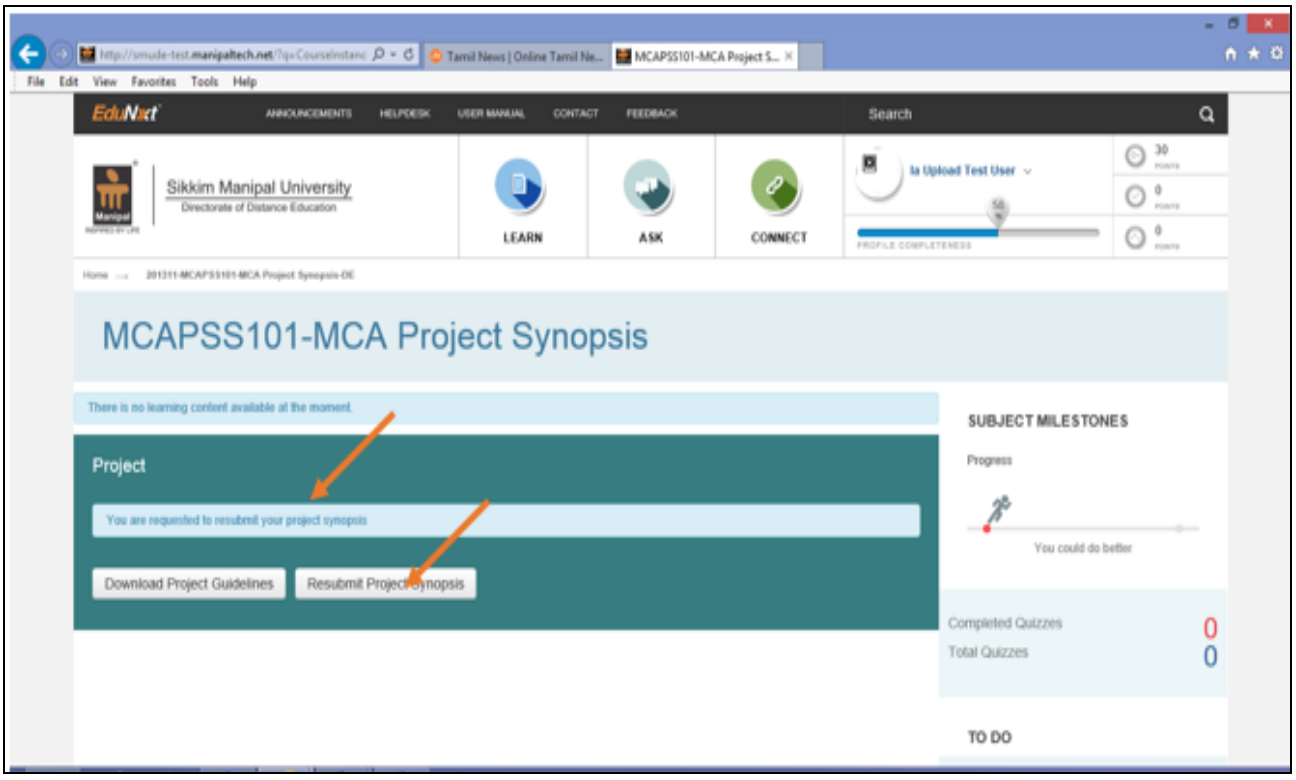


Step 9: (i) Once submitted, Project steering Committee will review your Synopsis submission and Guide Registration. You will get the Status updation in your mail box and EduNxt login.

(ii) If your synopsis is accepted by Project steering committee, you will get the approved mail and you can start your Project work.



Step 10: If your synopsis is rejected by Project steering committee, you will be requested to resubmit your synopsis again. Then click on “resubmit Project synopsis” and start from step 4.



7. Project Evaluation

The Project Work is evaluated under two categories (i) Internal Assessment (IA), which is a continuous assessment and will be done by Project Guide and (ii) External Assessment (EA), which involves evaluation of Project report and viva voce, will be done by external examiner during Project viva. Total marks allotted for Project is 200 wherein, marks allotted for IA is 60 and for EA, 140. Evaluation of Project Report is done by assessing Project report, presentation and Viva voce. A successful student should secure at least 40% marks separately in both (i) IA (i.e. 24/60) and (ii) EA (i.e. 56/140). The scheme of evaluation is represented in table 1.

Table 1: Scheme of valuation

Sl. No.	Internal/ External Valuation	Breakups		Marks
1	Internal Assessment (IA)	Synopsis		30
		Continuous Assessment		30
2	External Assessment (EA)	Project Report	Introduction	20
			Objective of Study	10
			Materials and Methods	10
			Results and Discussion	20
			Summary Literature cited	10
		Presentation		40
		Viva-voce		30
Total Marks				200

The “Project Work” MBT 405 is a 4 credits subject and the duration of the Project has to be 120 Hours.

Resubmission of the Project in case of failed students

If the student fails in this subject, he/she should repeat the whole cycle of the Project again, right from the submission of the Project synopsis. Students are advised to select a new topic for the Project with Guide’s suggestion and should prepare and submit the Project synopsis to the Project steering committee for approval as per the Project guidelines.

Important points for the Project work

1. Student can start the research work only on receiving the approval of synopsis and Guide from the University.
2. If the title of the Project differs from the title mentioned in the synopsis, the Project Report will be rejected and will be returned back to the student.

8. Annexures

Annexure-I: Submission of Project Synopsis & Guide Acceptance Form

SUBMISSION OF PROJECT SYNOPSIS AND GUIDE ACCEPTANCE FORM

(To be submitted to the Project steering committee)

PART A: Synopsis Registration

I. Student Details:

1. Name of the program :
2. Name of the Student :
3. Roll Number :
4. Session & Year :
5. Name and address of learning centre :

II. Project Details

6. Title of the Project :
7. Problem Statement (About 500 words) :
8. Plan of research :
9. Methodology to be used :

III. Guide Details:

10. Name of Proposed Guide :
11. Guide registration No. (If available) :
12. Designation :
13. Affiliation :
14. Qualification :
15. Total Experience :
16. Communication Address :
17. Contact No. :
18. E-mail ID :

PART – B: Guide Acceptance Letter

I Dr./Mr./Mrs. _____ working as _____ with _____ hereby confirm my willingness to guide Mr./ Ms. _____ RollNo. _____, attached to Learning Centre (code)_____ (Name) _____ (City) _____ in the topic _____ (title of the Project) during the Spring/ Summer/ Fall/ Winter session of _____ (year) period _____ (month/year) to _____ (month/year). I agree to this timeline and also to submit the Project status/ Internal Assessment marks to the University.

Place:
Date: (Signature of the Guide)

(Note: A Guide needs to get registered with the University if he/ she is guiding a SMUDE Project for the first time. Guide Registration form can be downloaded from the University Website)

DECLARATION

I hereby declare that this Project synopsis is an original work carried by me and will not submitted to any other University for fulfilment of any course of study.

(Signature of the Student)

Place:
Date:

(*Filled in Application forms to be signed by both student and the Guide. Forms must be scanned in either .pdf / .doc format and submitted through the EduNxt student's Login. For uploading please refer section 6.1 of this document)

Annexure-II: Project Guide Registration Form

PROJECT GUIDE REGISTRATION FORM

(To be submitted to the Project steering committee)

Affix Your Latest Photo

1. Name :

2. Date of Birth :

3. Present Employer :

4. Designation :

5. Contact Details :

i) Residential Address:

ii) Office Address :

iii) All communications to be sent to: Residential/ Office address (tick any one)

iv) Contact No. :

v) E-mail id :

6. Education Qualification (start with highest qualification):

(Please attach photocopies of degree certificates)

Sl. No	Degree	Specialization	Year of Passing	Institution/ University	Class

7. Area of Specialization/Interest :

8. Total yrs. of Experience :

(Please attach photocopies of Experience letters)

Sl. No	Name of the Organization	Designation	From	To

I hereby declare that the information provided by me is true. I agree with the rules and regulations given by the University.

Signature of the applicant

FOR OFFICE USE

Following details have been verified:	Yes	No
1) Qualification	☐	☐
2) Experience	☐	☐

3) Approved for Department / Specialization

Signature (Faculty in-charge)

Signature (Chairman-Project Steering Committee)

(*Filled in Registration forms must be scanned in either .pdf / .doc format and submitted along with credentials {Scanned Degree Certificates} to the email id projects.ahs@smudde.edu.in).

Annexure-III: Project Review Report Format

PROJECT REVIEW REPORT

1. Name of the programme :
2. Name of the Student :
3. Roll Number :
4. Name and address of learning centre :
5. Guide Name :
6. Guide Registration Number :
7. Communication Address :
8. Contact No :
9. Title of the Project :
10. Review Report :

Sl. No	Particulars	Review Status (Excellent / Good / Satisfactory)	Additional Remarks
Review Report – 1			
1	Literature Survey		
2	Problem Design		
3	Overall Performance		
Review Report - 2			
5	Implementation		
6	Testing		
7	Results		
8	Overall Performance		

Overall comments:

Signature of the Guide

(* To be submitted by the student to the LC along with signed Copies of Final Project Report)

Annexure-IV: Templates & Reference Style Guide

Annexure-IVA - Cover Page and Title Page

TITLE OF PROJECT REPORT

<Font Size 18><1.5 line spacing>

A PROJECT REPORT
<Font Size 14>

Submitted by
<Font Size 14><Italic>

NAME OF THE CANDIDATE
Reg. No.
<Font Size 16>

in partial fulfillment for the award of the degree of
<Font Size 14><1.5 line spacing><Italic>

Master of Science
<Font Size 16>

in
Biotechnology
<Font Size 14>

NAME OF THE LEARNING CENTRE (LC) & LC CODE
<Font Size 14>

Sikkim Manipal University-DDE, Manipal
<Font Size 16><1.5 line spacing>

MONTH & YEAR
<Font Size 14>

Manipal INSPIRED BY LIFE | Sikkim Manipal University
Directorate of Distance Education

Annexure-IV B

Bonafide Certificate

Certified that this Project report entitled **"……..."** is the bonafide work of "**……...<NAME OF THE CANDIDATE with REG.NO>……"** who carried out the Project work under my supervision.

Signature of Head of LC
<<Name>>
<<Address >>

Signature of Guide
<<Name >>
<<Address>>

Annexure-IV C

Table of Contents

Annexure-IV D

List of Tables

Annexure-IV E
List of Figures

Figures No.	Name of the Figure	Page No.

Annexure-IV F
List of Plates

Plates No.	Name of the Plates	Page No.

Annexure- IVG
Directions for Writing References

Directions for Journal Articles

Author. (Year). Title of article. *Title of Journal in Italics, Volume of Journal in Italics*, Pages.

Smith, John & Jane Doe. (2002). Identity crisis–a microscopic self-inspection. *Psychology Today*, *34*, 44-59.

Directions for Books

Author. (Year). *Title of book in italics*. Location: Publishing Company.

Roast, Chuck. (2007). *Gourmet guide to procaryotic protein.* New York, NY: Food for Thought Publishing Co.

Directions for Websites

Author or place of publication or publisher. (Date the web site was last updated).

Title of article. Location: Publisher. The exact character-by-character URL address (In addition give your **ranking** for the reliability of internet sources on a 1-10 scale with 10 being the most reliable).

Hacker, G. K. (2001) Viruses without cures. Washington, DC: National Center for Safe Computing. Retrieved September 20, 2004, from the World Wide Web: http://ur.nvr.safe.org (1).

Annexure -V

FORM 1 – PROJECT MARKS STATEMENT

LC CODE

LEARNING CENTRE NAME

DATE & TIME OF EXAMINATION

COURSE AND SEMESTER

PE MAX (Refer Table2)

PROJECT CODE	**P**	PROJECT MARKS										
		PE 1		PE 2		PE3		PE 4		PE 5		
REG. NUMBER	**Or**	INT	EXT	INT	EXT	INT	EXT	INT	EXT	INT	EXT	TOTAL
	A											

Name and Signature of Internal Examiner

Name and Signature of External Examiner

I hereby certify that the information given above has been verified and found correct in all aspects.

Date

Centre Seal

Signature of LC Head or Co-ordinator

****