PROJECT GUIDELINES

FOR

MASTER OF COMPUTER APPLICATIONS
(Programme Code: MCAOL)

MCSP – 232

(July 2024 & January 2025)

SCHOOL OF COMPUTER AND INFORMATION SCIENCES
BLOCK-C, NEW ACADEMIC COMPLEX
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
MAIDAN GARHI, NEW DELHI-110068

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MESSAGE FROM THE PROJECT COORDINATOR

The Master of Computer Applications (MCAOL) program prepares the students to take positions as Systems Analysts, Systems Designers, Software Engineers and Project Managers in any field related to Computer Applications and Information Technology. We have, therefore, imparted comprehensive knowledge covering the contemporary skills and core areas of computer science courses with equal emphasis on theory and practical. The Master of Computer Applications students have a 12-credit course in the last semester (4th semester). Students are eligible to submit project proposals (synopsis) after entering the 3rd semester of the Master of Computer Applications program, as per the project calendar. It would help if you worked on a project, preferably in a software industry or research organization.

Various courses' theoretical background provides you with the foundation, principles, and practices to develop effective ways to solve computing problems. The hands-on experience gained from the practical courses gives you the knowledge to work with various programming languages and contemporary tools.

The objective of the project work is to develop quality software solutions. During the project's development, you should be involved in all the stages of the software development life cycle, such as requirements engineering, systems analysis, systems design, software development, testing strategies, and documentation, with an overall emphasis on developing reliable software systems. The primary focus of the project is to understand and gain knowledge of the principles of software engineering practices and to participate in and manage large software engineering projects in the future. In addition, you may also do a project in the latest areas. The project work should compulsorily include software development. Physical installations, configuring the LAN/WAN, theoretical projects, or study of the systems, which does not involve software development, are strictly prohibited.

Approval of the project proposal is mandatory to continue and submit the work. Prepare your project proposal strictly as per guidelines. Disapproval of project proposals leads to loss of your valuable time. To avoid this loss, take your proposal preparation very seriously and consult for every point on which you have doubts with your project guide/supervisor.

You are advised to take this project work very seriously, as these efforts may be considered 6-month experience in some software companies. Topics selected should be complex and large enough to justify a MCAOL project. Please refrain from repeating the topic undertaken at the BCA level. The project should be genuine and original and not be copied anywhere else. If found copied, the project report will be forwarded to the Exam Discipline Committee of the University as an Unfair means case for necessary action. Students should strictly follow and adhere to the MCSP-232 project guidelines.

I wish you all the success.

MCAOL Project Coordinator
Email: mcaolsocis@ignou.ac.in

I. CALENDAR FOR THE MCAOL PROJECT

Sl.No.	*Topic*	*Date*
1.	Submission of project proposal (synopsis) at the link provided on Learning Management System (LMS) portal	**Twice a year as shown below:** **1st April to 30th June** **or** **1st October to 31st December**
2.	Approval of Project Proposal	**Approx. 30 days** after the project proposal is received.
3.	Submission of the Project Report (**Soft copy**) at the respective link provided on Learning Management System (LMS) portal	**Twice a year as shown below:** **1st July to 30th September (For Project Proposals that have been approved during the 1st April to 30th June slot) or** **1st January to 31st March (For Project Proposals that have been approved during 1st October to 31st December slot)**
4.	Viva-Voce to be conducted	**In May or July** (For project reports submitted during 1st January - 31st March slot) **In November or January** (For project reports submitted during 1st July – 30th September slot)

SCHOOL OF COMPUTER AND INFORMATION SCIENCES
IGNOU, MAIDAN GARHI, NEW DELHI – 110 068

II. PROFORMA FOR THE APPROVAL OF MCAOL PROJECT PROPOSAL (MCSP-232)

***(Note:** All entries of the proforma of approval should be filled up with appropriate and complete information. Incomplete proforma of approval in any respect will be summarily rejected.)*

Project Proposal No :……..

(for office use only)

Enrolment No.: ……

E-mail: ……..……..……...

Mobile No.: …..…….

1. Name and Address of the Student: ……..…….
2. Title of the Project***: ……..…….
3. Name and Address of the Guide: …..……
   ……
4. Educational Qualification of the Guide: (Attach bio-data also)
   (*in Computer Science / IT only)

Ph.D*	M.Tech.*	B.E*/B.Tech.*	MCA	M.Sc.*
☐	☐	☐	☐	☐

5. Working / Teaching experience of the Guide**:……
   …….
   (***Note: At any given point of time, a guide should not provide guidance for more than 5 MCA students of IGNOU*)
6. Software used in the Project***:……..
   (*** Please refer to section VIII of these guidelines)
7. Is this your first submission? ☐ Yes ☐ No

Signature of the Student
Date: ……

Signature of the Guide
Date: …….

For Office Use Only

Name:…….....

☐ Approved ☐ Not Approved

…….
Signature, Designation, Stamp of the
Project Proposal Evaluator
Date: …….

Suggestions for reformulating the Project by evaluater:

Ensure that you include the following while submitting the Project Proposal:

1. **Proforma for Approval of Project Proposal duly filled and signed by both the student and the Project Guide with date.**

2. **Biodata of the project guide with her/his signature and date. Please also attach the self attested copy of the degree certificate and identity proof of the Guide.**

3. **Synopsis of the project proposal (15-20 pages).**

Note:

i. At any given point of time, a guide should not provide guidance to more than 5 MCA students of IGNOU.

ii. If your project proposal is <u>Not Approved,</u> then suggestions given for reformulating the project must be incorporated in the new project proposal.

iii. If your project proposal is <u>approved</u> then suggestions given for reformulating the project must be incorporated in the final project report otherwise the project may be rejected at any stage of evaluation.

iv. On approval of your project proposal, you must perform a thorough analysis, design, implementation and testing of your project.

v. Violation of the project guidelines will lead to the rejection of the project at any stage.

Note:
A copy of the complete Project Proposal (along with Project Performa, Project Synopsis, Bio data & self-certified copy of degree certificate of the guide etc.) uploaded on LMS, should be retained by the student for future reference.

III INTRODUCTION AND OBJECTIVES

The Project work constitutes a major component in most professional programmes. 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 Master of Computer Applications Online Learning requirements, but also provides a mechanism to demonstrate your skills, abilities and specialisation. The project work should compulsorily include the software development. Physical installations or configuring the LAN/WAN or theoretical projects or study of the systems, which does not involve software development, are strictly not allowed.

Students are eligible to submit the project proposals after entering into the 3rd semester of Master of Computer Applications, as per the calendar of the project.

OBJECTIVES

The objectives of the project is to help the student develop the ability to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and research laboratories. After the completion of this project work, the student should be able to:

- Describe the Systems Development Life Cycle (SDLC).
- Evaluate systems requirements.
- Complete a problem definition.
- Evaluate a problem definition.
- Determine how to collect information to determine requirements.
- Work on data collection methods for fact finding.
- Construct and evaluate different analysis models including traditional models such as DFDs, ERD.
- In case, you are using Object Oriented Approach for your project development, draw UML diagrams to represent system analysis and design.
- Provide process description in the form of structured English or decision tables or decision trees.
- Evaluate alternative tools for the analysis process.
- Create and evaluate such alternative graphical tools as systems flow charts and state transition diagrams.
- Decide the software requirement specifications and hardware requirement specifications.
- Plan the systems design phase of the SDLC.
- Distinguish between logical and physical design requirements.
- Design and evaluate system outputs.
- Design and evaluate systems inputs.
- Design and evaluate validity checks for input data.
- Design and evaluate user interfaces for input.
- Design and evaluate file structures to include the use of indexes.
- Estimate storage requirements.
- Explain the various file update processes based on the standard file organizations.
- Decide various data structures.
- Construct and evaluate data models like entity-relationship (ER) diagrams for RDBMS related projects.

- Perform normalization for the un-normalized tables for RDBMS related projects.
- Decide the various processing systems to include, you may select from distributed, client/server, online, cloud-based systems
- Schedule projects using both GANTT and PERT charts.
- Perform coding for the project.
- Documentation requirements and prepare and evaluate systems documentation.
- Perform various systems testing techniques/strategies to include the phases of testing.
- Systems implementation and its key problems.
- Generate various reports.
- Be able to prepare and evaluate a final report.
- To decide the future scope and further enhancement of the system.
- Work effectively as an individual or as a team member to produce correct, efficient, well organized and documented programs in a reasonable time.
- Recognize problems that are amenable to computer solutions, and knowledge of the tools necessary for solving such problems.
- Develop of the ability to assess the implications of work performed.
- Get good exposure and command in one or more application areas and on the software
- Develop quality software using the software engineering principles.
- Develop of the ability to communicate effectively.

NOTE: At any given point of time, a guide should not provide guidance for more than 5 MCA students of IGNOU.

IV TYPE OF THE PROJECT AND ELIGIBILITY CRITERIA OF THE PROJECT GUIDE

Type of the Project

The majority of the students are expected to work on a real-life project preferably in some industry/ Research and Development Laboratories/Educational Institution/Software Company. Students are encouraged to work in the areas listed at the end **(Refer page no.18)**. However, it is ***not mandatory*** for a student to work on a real-life project. The student can formulate a project problem with the help of her/his Guide and submit the project proposal of the same. **Approval of the project proposal is mandatory**. If approved, the student can commence working on it, and complete it. Use the latest versions of the software packages for the development of the project.

Eligibility criteria of a Project Guide

1. A person having Ph.D./ M.Tech. in Computer Science with a minimum of one year of experience.

Or

2. A person having B.E./B.Tech. (Computer Science), MCA, M.Sc. (Computer Science) with minimum 2 years' experience, preferably in software development.

Steps involved in the project work

The complete project work should be done by the student only. The role of guide should be about guidance wherever any problem encounters during project. The following are the major steps involved in the project, which may help you to determine the milestones and regulate the
Scheduling of the project:

- Select a topic and a suitable guide.
- Prepare the project proposal in consultation with the project guide.
- Upload the project proposal along with the necessary documents on the LMS.
- Notification of the project proposal approval.
- Carry out the project-work.
- Prepare the project report.
- Upload the project report through LMS.
- Appear for the viva-voce online as per the intimation.

Communication of the approval

Communication regarding the project proposal Approval/Non-approval will be sent to you through Email/LMS approximately within four to six weeks after the submission of the project proposal on LMS. In case you do not receive any communication from your Nodal RC within four to six weeks after last date of submission of project proposal/synopsis, you are advised to contact your Nodal RC.

Resubmission of the project proposal in case of non-approval

In case of non-approval, the suggestions for reformulating the project will be communicated to you. The revised project synopsis along with a new proforma, should be re-submitted along with a copy of the earlier synopsis and non-approval project proposal proforma in the **next slot.** For example, if the student submitted the synopsis during the 1st April to 30th June slot and is not approved due to the reasons mentioned by the evaluator, s/he is eligible to resubmit the revised project synopsis only during the next slot i.e., 1st October to 31st December. If the student wants to change the project topic or software or the project guide, s/he may do so and can submit a fresh project proposal. **The revised project proposal should be uploaded, along with the copy of the non-approved proforma of the earlier submitted proposal on LMS.**

Resubmission of project report in case of failed students

If a student is unsuccessful in the project, s/he should ‘re-do’ the whole cycle, right from the submission of the project proposal. Students are advised to select a **new topic** for the project and should prepare and submit the project proposal on LMS. Respective submissions of the project synopsis and the project reports should be done strictly as per the “Calendar for the MCAOL project” given in the project guidelines.
In case of failed students, a **pro-rata fee (as per University norms)** needs to be paid online for the resubmission of the project report.

Enquiries

Enquiries regarding the project proposal approvals and the project reports should be addressed to the **Regional Director of the Nodal Regional Centre concerned.** In all correspondence with the University regarding your project, please quote your Enrolment No., Project Proposal No. and Project Report No.

V POINTS TO REMEMBER WHILE PREPARING THE PROJECT PROPOSAL

1. **Project Proposal Formulation**

- **The project proposal should be prepared in consultation with your guide**. The project proposal should clearly state the project objectives and the environment of the proposed project to be undertaken. **The project work should compulsorily include the software development.** The project proposal should contain complete details in the following form:

- Proforma for Approval of Project Proposal (see page no.5) duly filled and signed by both the student and the Project Guide with date.
- Bio-data of the project guide with her/his signature and date.
- Self-attested copy of Degree certificate of Project Guide
- Synopsis of the project proposal (15-20 pages) covering the following aspects:

  (i) Title of the Project.
  (ii) Introduction and Objectives of the Project.
  (iii) Project Category (RDBMS/OOPS/Networking/Artificial Intelligence/Expert Systems/ Machine Leaning/Data Science/Image Processing/Mobile Computing etc.).
  (iv) Tools/Platform, Hardware and Software Requirement specifications.
  (v) Problem Definition, Requirement Specifications (Detailed functional Requirements and Technical Specifications)/ Literature Review, Project Planning and Scheduling (Gantt chart and PERT chart).
  (vi) Scope of the solution.
  (vii) Analysis (DFDs up to level 2, Complete ER Diagrams with cardinality, Activity Diagram, Class Diagrams, State Diagrams etc. or other models as per the project requirements).
  (viii) A complete Database and tables detail with Primary and Foreign keys, and proper constraints in the fields (as per project requirements)
  (ix) A complete structure which includes:
    - Number of modules and their description to provide an estimation of the student's effort on the project. Along with process logic of each Module.
    - Data Structures as per the project requirements for all the modules.
    - Implementation methodology
    - List of reports that are likely to be generated.
  (x) Overall network architecture (if required for your project)
  (xi) Implementation of security mechanisms at various levels
  (xii) Future scope and further enhancement of the project.
  (xiii) Bibliography in standard format (IEEE/APA/MLA).

2. Project proposal completed in all aspects with necessary enclosures should be uploaded online through LMS only.

3. A project proposal, once approved, **is valid for one year** *(two slots)*. In case, a student is unable to submit her/his project report as per the slot, s/he may be given another chance for submission of the project report in the subsequent slot. If s/he still does not submit the project report, a **fresh synopsis approval is needed**.

4. All entries of the proforma of approval should be filled up with appropriate and complete information. Incomplete approval-proforma in any respect will be summarily rejected.

5. A **copy of the complete Project Proposal** (along with Project Proforma, Project Synopsis, Bio-data of the guide etc.) uploaded, should be retained by the student for future reference.

6. The evaluated project proposal proforma along with the details of Approved/Not approved will be notified to the student within approx. 5-6 weeks after the proposal is uploaded on LMS. In case it is Not approved, the suggestions for reformulating the project proposal are given on the evaluated proposal on LMS.

7. The project is a part of your final semester (4^{th} semester) curriculum. **Students are allowed to submit the project proposals in the 3^{rd} semester of Master of Computer Applications** as per the calendar.

8. In case the students require any project trainee letter from the University for doing a project in any organization/software company, they can get a **"Project Trainee letter" (Refer page 21)** attested by the Project Coordinator/Regional Director of nodal RC.

9. ***Please ensure that at any given point of time, your guide should not provide guidance for more than 5 MCA students of IGNOU.***

10. **Violation of the project guidelines will lead to the rejection of the project at any stage.**

VI POINTS TO REMEMBER WHILE PREPARING THE PROJECT REPORT

1. **Project Report Formulation:**

   The project report **should** contain the following:

   (i) Original copy of the Approved Proforma and Project Proposal.
   (ii) Bio-data of the guide with her/his signature and date.
   (iii) Certificate of Originality (Format given on Page 19).
   (iv) Project documentation.
   (v) The student needs to retain the executable file(s) of the complete project and should possess while appearing for the viva-voce along with the project report.

2. The **project documentation** may be about 100 to 125 pages (excluding coding). The project documentation details should not be too generic in nature. Appropriate project report **documentation** should be done, like, **how you have done the analysis, problem formulation, design, coding and testing, etc.,** ***in respect of your project***. To be more specific, **whatever the theory in respect of these topics is available in the reference books**

should be avoided as far as possible. **The project documentation should be in respect of your project only.** The project documentation should include the topics given below. Each and every component shown below carries certain weightage in the project report evaluation.

- Table of Contents/Index with page numbering
  - Introduction/Objectives
  - System Analysis
    - Identification of Need
    - Project Planning and Project Scheduling (PERT Chart and Gantt Chart both)
    - Software requirement specifications (SRS)
    - Software Engineering Paradigm applied
    - Data models (like DFD), Control Flow diagrams, State Diagrams/Sequence diagrams, Entity Relationship Model, Class Diagrams/CRC Models/Collaboration Diagrams/Use-case Diagrams/Activity Diagrams and other models depending upon your project requirements
  - System Design
    - Modularisation details
    - Data integrity and constraints
    - Database design, Procedural Design/Object Oriented Design
    - User Interface Design
    - Test Cases (Unit Test Cases and System Test Cases)
  - Coding
    - SQL commands/Object description for (i) data or database creation (along with constraints), (ii) data collection, cleaning and generation and insertion into data structure or tables and (iii) access rights for different users
    - Complete Project Coding
    - Comments and Description of Coding segments
  - Standardization of the coding
    - Code Efficiency
    - Error handling
    - Parameters calling/passing
    - Validation checks
  - Testing
    - Testing techniques and Testing strategies used
    - Testing Plan used
    - Test reports for Unit Test Cases and System Test Cases
    - Debugging and Code improvement
  - System Security measures (Implementation of security for the project developed)
    - Database/data security
    - Creation of User profiles and access rights
  - Reports (sample layouts should be placed)
  - Future scope and further enhancement of the Project
  - Bibliography
  - Appendices (if any)
  - Glossary.

3. The project report should normally be typed with single line spacing. All the pages, tables and figures must be numbered. Tables and figures should contain titles.

4. If any project report is received in the absence of the approved project proposal proforma (in original), project synopsis, bio-data of the guide with her/his signature on it, certificate of originality, it will be summarily rejected and returned to the student for compliance.

5. Throughout the project report, the title of the project should be the same as per the approved synopsis. Signature of the Project Guide in the Certificate of Originality should match with the signature in the Project Proposal proforma also.

6. **Only single pdf file of** the **original project report** (soft copy) need to be uploaded on Learning management System (LMS) as per the date mentioned in the Calendar for the project. A softcopy of the executable file(s) of the project and the Project Report must be retained by the student, which needs to be produced before the examiner at the time of viva-voce.

7. **Preferably**, **not more than one student is permitted to work on a project**. However, in case a project is comprehensive enough that requires one year or more time for its completion, then as per requirements of six months per student, at most two students may work on the same project. **In this regard, prior recommendation is mandatory and must be obtained from the MCAOL Project Coordinator** by sending the complete synopsis by both the students through an E-mail to: MCAOLSOCIS@IGNOU.AC.IN

8. If two students have been allowed to work on a project, the project synopsis and project reports by them must include only different modules undertaken/worked upon **individually.** Each student must submit a **separate** project proposal and a separate project reports related to her/his modules. **Completely identical project synopsis and/or project reports are not allowed**. Only introductory and possibly concluding remarks may be similar or common. Each student has to undergo all the phases/stages of the software project development life cycle. In this case, both the students must attach **the prior recommendation obtained from the MCAOL Project Coordinator along with the synopsis should be sent to the Nodal Regional Centre concerned for evaluation. A single copy of the project synopsis and/or project report comprising of work of two or more students shall not be entertained. Violation of these project guidelines may lead to the rejection of the project at any stage.**

9. Title of the project should be kept the same throughout the project.

10. Student should be involved in each and every phase of Project Development. If it is found that student is not involved in any phase for example coding phase, it may lead to the rejection/disqualifying of the project at any stage.

VII. ASSESSMENT GUIDELINES FOR PROJECT EVALUATION

Every component of the project work and the viva voce carries its weightage, so the student needs to concentrate on all the sections in the project report formulation.
This section gives a few general parameters as checkpoints for assessing any software development project. You can emphasize these points during the project report preparation and evaluation. Assessment will be based on the quality of your report, the project's technical merit, and the project's execution. Technical merit assesses the quality and depth of the intellectual effort you have put into the project. Project execution is concerned with evaluating how much work you have put in.

Analysis

In Project planning include cost estimation and project scheduling. The cost and efforts estimation are to be done with the help of functional point analysis or other similar methods. The project scheduling is identified with:

(i) PERT chart: Proper decomposition of stages, and
(ii) Gantt chart: Time, line structure and validity of chart.

You may know that the software requirement specification (SRS) document is one of the important documents of your project. The indicators for SRS document are whether you have used some standardization like IEEE standards or any other international standard, or whether your SRS has a proper structure based on sound software engineering concepts or it is given in a running text. Project analysis for DBMS/Application development projects should contain the ER diagram, Data Flow Diagram and Data Dictionary, so you should include these with the following requirements. However, for other categories of project you should prepare class diagrams, behavior model and/or state transition diagram and details of various data structures used.

- The Entity Relationship diagram (ER Diagram) should have:
    - Proper symbol of attributes, entities, relationships, cardinality mentioned, and Relationship of ER diagram to SRS with strong association
- Data Flow Diagram (DFD) should have:
    - All Data flow should be levelled and should have proper input and output.
    - Relationship of data flow to data dictionary
    - Context Diagram, Level 1 and Level 2.
- Data Dictionary: It should explain each entity and relationship in ER diagram and data flow in DFD.

Design

Project design should include the desired features and operations in detail, including user interface design, program structure, schema design and normalized tables and data integrity and constraints. You should include them with the requirements given below:

- **Program Structure:** It should have the proper modularization of software and specification of each module.
- **Schema Design and Normalized Tables:** Normalize the table to minimum 3NF. If any demand of Demoralization clearly explain the reasons.
- **Data Integrity and Constraints:** Explain the referential diagram. Define entity integrity, which should include keys, alternate keys and other keys, value constraints and ranges.
- **Procedural Design:** Explain using Flowchart / Pseudo code / PDL.
- **User Interface Design:** Coherence with dataflow and processor; Consistency of interface and naming convention. Validation checks should be kept wherever necessary.
- **Architecture:** Program architecture and explanation on suitability of data structure used.

Coding

Coding phase of software development includes different activities like refining the algorithms for individual components, transferring the algorithms into a programming language (coding), translating the logical data model into a physical one and compiling and checking the syntactical correctness of the algorithm with these activities. You should include the comments and description in code, use the standardization in coding, use the methodology for error handling and security implementation. These parameters ensure software quality and reliability. You should include them with the requirements given below:

- **Comments and Description:** Should have comments with functional description which include the input, output, total function calls to/from other functions, function parameters, description of main variables, Data type, logic description, etc.
- **Standardization of Coding:** Use of naming convention of variable and functions, nested depth, naming constant, use of data structure and style.
- **Error Handling:** Explain exceptions handling and conditional checking.
- **Parameter passing and calling:** Check the technique used for this purpose, how it optimises the coding.
- **Security Mechanisms:** Maintain confidentiality, integrity and authorisation according to the requirement and needs of the system. Also maintain database level security, use of Views, use of revoke and grant, user and access rights and ensure steps taken against hacking of the system.

Testing

Testing is a process of devising a set of inputs to a given piece of software that will cause the software to exercise some portion of its code. The software developer can then check if the results produced by the software are in accordance with their expectations. It includes several activities such as correcting syntactically and semantically erroneous system components, detecting as many errors as possible in the software system, and assuring that the system implementation fulfils system specifications.

It ensures the software's quality, efficiency, and reliability, which are measured by the testing methodology and techniques used for unit, integrated, system testing, etc.

The testing should not be too generic, containing only definitions. You should give all the test case designs, reports and results of test cases for unit, integrated, system testing, etc. It should be properly explained how you debugged your code and what actions you have taken to improve it. Good testing can be measured by criteria such as correctness, reliability, user-friendliness, maintainability, efficiency and software portability.

System Security Measures

The student should clearly emphasize the various levels of security measures implemented in the project.

Data input and output

The project report should include the data samples used in the project as input and corresponding data output for ready reference.

Screen Layouts/Screen Shots

Screen layout//Screen Shots for various screens/user interfaces should also be placed in a proper order in the project report for ready reference.

Organization of the Project Report

Report organization improves the professional attitude of writing reports. You should emphasize on the proper organization of project report, the cover page, page numbering, organization of contents, and proper visibility of images, graphs, diagrams, etc.

Viva Voce

In this evaluation component, students present their knowledge and skills to the expert. Other than the questions about the project-related areas and the courses concerned, students may be asked to show the project demo. Also, one may be asked to write portions of the code for a problem to demonstrate their coding capabilities.

While appearing for the viva voce, along with the project report, the student must carry the project work's executable file(s).

Project Evaluation

The Project Report is evaluated for 150 marks, and the viva voce is for 50 marks. **Viva voce is compulsory** and forms part of the evaluation. In order to be declared successful in the Project (MCSP-232), a student must secure **40% marks in each component (i) Project Evaluation and (ii) Viva voce**. Passing in both components is compulsory. If a student submits the project report as per the schedule and fails to attend viva, their Project will remain incomplete. In such a case, the student should contact the concerned Nodal Regional Centre.

Students will be duly informed about the Viva voce via email from the Regional Director of the concerned Nodal Regional Centre. Viva voce will be conducted online. So, **students need to ensure proper Internet connectivity and a suitable ambience during the Viva voce**.

Unfair means

Students shall not use unfair means concerning the project synopsis or report. The University will take the unfair means cases of the project synopsis and project reports seriously. Such cases will be referred to the Examination Discipline Committee of IGNOU for necessary action.

VIII. SOFTWARE AND BROAD AREAS OF APPLICATION

FRONT END / GUI Tools	Jbuilder , NetBeans, Eclipse, JavaScript, ReactJS, AngularJS, Flutter, Vue.js, Bootstrap, Ionic, HTML5, Boilerplate, Npm, Meteor, Elm, TypeScript, Grunt Backbone.js, Sencha Ext JS etc.
RDBMS/BACK END	Oracle, Ingres, Sybase, Progress, SQL Plus, Versant, MySQL, SQL Server, DB2, NoSQL databases
LANGUAGES	Python, Java, C#, etc.
.NET Platform	VB.Net, C#. Net, Visual C#. Net, ASP.Net
UNIX INTERNALS	Device Drivers, RPC, Threads, Socket programming
ARCHITECTURAL CONCEPTS	CORBA, TUXEDO, MQ SERIES
INTERNET TECHNOLOGIES	DHTML, Java script, VB Script, Perl & CGI script, Java, Active X, RMI, CORBA, SWING, JSP, ASP, XML, EJB, Java Beans, Servlets, Visual Age for JAVA, UML, VRML, WML, Vignette, EDA, Broadvision, Ariba, iPlanet, ATG, BigTalk, CSS, XSL, Oracle ASP server, AWT, J2EE, LDAP, ColdFusion, Haskell 98, PHP,NetBeans
NETWORK/WIRELESS TECHNOLOGIES	Blue Tooth, 3G, ISDN, EDGE
APPLICATION AREAS	Financial / Insurance / Manufacturing / Multimedia / Computer Graphics / Instructional Design/ Database Management System/ Internet / Intranet / Computer Networking-Communication Software development/ ECommerce/ ERP/ MRP/ TCP-IP programming / Routing protocols programming/ Socket programming.

NOTE:

(i) Projects should not be developed using the old packages like Dbase III plus, Foxpro, Visual Foxpro and MS Access. Also, projects should not be developed using the combination of Visual Basic as the front end and MS Access as the back end. The latest versions of the software are to be used. The project work should compulsorily include software development. Physical installations, configuring the LAN/WAN, theoretical projects, or study of the systems that don't involve software development are strictly prohibited.

(ii) C/C++ languages should not be used for any information management system project, such as a hospital/reservation/library/school/college management system.

(iii) Students can also develop applications using tools/languages/software not listed above if they are part of latest technologies such machine learning, deep learning and AI applications. Use the latest versions of the software packages for the project development.

INDIRA GANDHI NATIONAL OPEN UNIVERSITY

Maidan Garhi, New Delhi – 110068
School of Computer and Information Sciences
Phone: (011) 29572902

Project Trainee Letter (MCSP-232)

Date:

This is to certify that Mr/Ms _____ with Enrolment No._____ is a final year student of the Master of Computer Applications (Programme Code: MCAOL), Indira Gandhi National Open University (IGNOU), and is required to do a final semester project work in his/her final year starting from January/July session. His/Her project must be undertaken in a software development Organization/ Industry/Research Laboratory under the supervision of a guide, preferably from the same organisation with the educational qualifications and experience mentioned in the MCSP-232 project guidelines. During his/her course of study, the student has studied and gained knowledge in various Computer Science courses such as Design and Analysis of Algorithms, Object Oriented Analysis and Design, Discrete Mathematics, Accountancy and Financial Management, Computer Networks, Software Engineering, Data Mining and data warehousing, Artificial Intelligence and Machine Learning, Data Science and Big data, Image processing, mobile computing. S/he has hands-on experience in C programming, Internet Technologies, JAVA, Python, R programming, etc. S/he may please be given a chance to work in your esteemed organization and complete their project work. I assure you of his sincere and quality output. The experience gained by this project not only benefits the student in partially fulfilling the requirements of the Master of Computer Applications of IGNOU but also lays a foundation for their future career.

I am looking forward to your positive response, support and cooperation.

Signature & Name of the Programme Coordinator/
Regional Director with Date and Stamp

X. CERTIFICATE OF ORIGINALITY

This is to certify that the project report entitled _____ submitted to **the School of Computer and Information Sciences, Indira Gandhi National Open University** in partial fulfilment of the requirement for the award of the degree of **MASTER OF COMPUTER APPLICATIONS(ONLINE),** is an authentic and original work carried out by Mr. / Ms._____ with enrolment no. _____ under my guidance.

The matter embodied in this project is genuine work done by the student and has not been submitted whether to this University or to any other University / Institute for the fulfilment of the requirements of any course of study.

…… ...…….

Signature of the Student: Signature of the Guide

Date: …….. Date: ……

Name and Address
the student

Name, Designation and
Address of the Guide

…….. ……..

…….. ……..

…….. ……..

…….. ……..

Enrolment No……

XI SAMPLE COVER PAGE OF THE PROJECT REPORT

INDIRA GANDHI NATIONAL OPEN UNIVERSITY

MCA Project (MCSP–232)
on

TITLE OF THE PROJECT

by

Student's Full Name & Enrolment No:

Under the Guidance
of
Project Guide's Full Name

Submitted to the School of Computer and Information Sciences, IGNOU in partial fulfillment of the requirements for the award of the degree

Master of Computer Applications (MCAOL)

Year of Submission

Indira Gandhi National Open University
Maidan Garhi
New Delhi – 110068.