PROGRAMME GUIDE

FOR

MASTER OF COMPUTER APPLICATIONS
(Programme Code: MCA_NEW)

MCSP – 232
PROJECT GUIDELINES
(July 2023 & January 2024 Sessions)

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

CONTENTS

MESSAGE FROM THE PROJECT COORDINATOR

The Master of Computer Applications (MCA_NEW) programme prepares the students to take up positions as Systems Analysts, Systems Designers, Software Engineers and Project Managers in any field related to Computer applications and information technology. We had therefore imparted you the comprehensive knowledge covering the contemporary skills and core areas of computer science courses with equal emphasis on the theory and practical. The Master of Computer Applications students have a 12-credit course in the last semester (4th semester). You should be working on a project preferably in a software industry or any research organization. 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.

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

The objective of the project work is to develop quality software solution. During the development of the project, you should involve in all the stages of the software development life cycle like requirements engineering, systems analysis, systems design, software development, testing strategies and documentation with an overall emphasis on the development of reliable software systems. The primary emphasis of the project work is to understand and gain the knowledge of the principles of software engineering practices, so as to participate and manage a large software engineering projects in future. In addition, you may also do a project in latest areas. 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.

Approval of the project proposal is mandatory to continue and submit the project work. Prepare your project proposal strictly as per guidelines. Disapproval of project proposal 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 doubt, with your project guide/supervisor.

You are advised to take this project work **very seriously**, as these efforts may be considered as 6-months experience in some software companies. Topics selected should be complex and large enough to justify as a MCA project. Please do not repeat the topic undertaken at BCA level. The project should be genuine and original in nature and should not be copied from 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. In case of project resubmission, please confirm the fees and other details with the Regional Centre/Study Centre/website. Students should strictly follow and adhere to the MCSP-232 project guidelines.

I wish you all the success.

MCA Project Coordinator

I CALENDAR FOR THE MCA PROJECT

Sl.No.	Topic	Date
1.	Submission of a guide's bio-data and project proposal at the following address: **The Regional Director of your Regional Centre**	**Twice a year as shown below:** **1st April to 30th June** **or** **1st October to 31st December**
2.	Approval of Project	**30 days** after the project proposal is received.
3.	Submission of the Project Report (**one copy**) in **bound form** to: **The Regional Director of your Regional Centre**	**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)

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IGNOU, MAIDAN GARHI, NEW DELHI – 110 068

II. PROFORMA FOR THE APPROVAL OF MCA 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.: ………………………** **Study Centre: ……………….……….** **Regional Centre:…… RC Code:……** **E-mail: …………..………..…………...**

Mobile/Tel No.: …..………………..

1. Name and Address of the Student: …………………..………………………………….

2. Title of the Project***: ………..…………………………………………….

3. Name and Address of the Guide: …..…………………………………………………
…………………………………………………………

	Ph.D*	M.Tech.*	B.E*/B.Tech.*	MCA	M.Sc.*
4. Educational Qualification of the Guide: (Attach bio-data also) **(*in Computer Science / IT only)**	☐	☐	☐	☐	☐

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   Signature of the Guide
Date: …………………   Date: …………………….

For Office Use Only   Name:…………………………..............

☐	☐

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

Approved   Not Approved   Date: …………………….

Suggestions for reformulating the Project:

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. **Bio-data of the project guide with her/his signature and date. Please also attach the certified copy of proof of identity of guide.**

3. **Synopsis of the project proposal (14-18 pages).**

4. **A self-addressed envelope with duly affixed postage stamps (to send it by ordinary post only) on it.**

Note:

i.   *At any given point of time, a guide should not provide guidance for 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 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.*

A photocopy of the complete Project Proposal (along with Project Performa, Project Synopsis, Bio data of the guide) submitted to your Regional Centre, 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 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 different 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, wellorganized 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.
- Submit the project proposal along with the necessary documents to the Regional Director of the Regional Centre concerned.
- Receipt of the project approval from the Regional Centre concerned.
- Carry out the project-work.
- Prepare the project report.
- Submit the project report to the Regional Director of the Regional Centre concerned
- Appear for the viva-voce as per the intimation by the Regional Director.

Communication of the approval

Communication regarding the project Approval/Non-approval will be sent to you within four to six weeks after the receipt of the project proposal by the Regional Centre concerned. In case you do not receive any communication from your RC within four to six week after last date of submission of project proposal/synopsis, you are advised to contact your 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 sent along with the original copy/ photocopy of the non-approved proforma of the earlier submitted proposal, to the Regional Centre Concerned.**

Resubmission of project in case of failed students

If the 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 to the Regional Centre concerned as per the project guidelines. There are no separate slots for the submission of the project synopsis/project reports for the failed students. Respective submissions of the project synopsis and the project reports should be done strictly as per the "Calendar for the MCA project" given in the project guidelines.

In case of failed students, a **pro-rata fee of Rs.2500/ -** by way of a Demand Draft in favour of IGNOU and payable at the city where you Regional Centre is located should be remitted along with 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 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.
- 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 (Data Models like 0, 1 and 2 level DFDs, 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.
      - Process Logic of each module.
      - Implementation methodology
      - List of reports that are likely to be generated.
    (ix) Overall network architecture (if required for your project)
    (x)   Implementation of security mechanisms at various levels
    (xi) Future scope and further enhancement of the project.
    (xii) Bibliography
- A self-addressed envelope with duly affixed postage stamps (to send it by ordinary post only) on it.

2. Project proposal completed in all aspects with necessary enclosures should be sent to the Regional Director of the Regional Centre concerned. While posting your proposal to your Regional Centre, on the top of the envelope you should mention **"MCA_NEW Project Proposal (MCSP-232)". Under no circumstances, should the project proposal be sent to SOCIS, IGNOU, New Delhi.**

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 **photocopy of the complete Project Proposal** (along with Project Proforma, Project Synopsis, Bio-data of the guide) submitted to your Regional Centre, should be retained by the student for future reference.

6. The evaluated project proposal proforma along with the details of Approved/Disapproved will be sent to the student within 6-8 weeks after the proposal is received at Regional Centre concerned. In case it is disapproved, the suggestions for reformulating the project will be communicated to the student. Revised project proposal proforma, synopsis, bio-data of the guide with her/his signature on it, should be sent along with the original copy/photocopy of the non-approved proforma of the earlier project proposal, to the Regional Centre Concerned.

7. The project is a part of your final semester (4th semesters) curriculum. Students are eligible to submit the project proposals in the 3rd 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 / Asst. Regional Director.

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 23).
(iv)   Project documentation.
(v)   A CD consisting of the executable file(s) of the complete project should be attached on the last page of the project report. In no case, it should be sent separately. The student needs to retain the identical copy of the CD that should be carried 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.

  ¨ Should attach a copy of the CD containing the executable file(s) of the complete project.

3.   The project report should normally be printed with single line spacing on A4 paper (one side only). 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 and CD 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 one copy of** the **original project report** in the bound form along with the CD (containing the executable file(s) of the project should be enclosed in the last page) is to be submitted to the Regional Director of the Regional Centre concerned through registered insured post by the date mentioned in the Calendar for the project. One photocopy of the same Project Report and the CD containing the executable file(s) must be retained by the student, which should be produced before the examiner at the time of viva-voce.

7.   A photocopy of the project report is **not acceptable** for submission. Kindly mention on the top of the envelope **MCA PROJECT REPORT (MCSP-232).** This will facilitate sorting out project reports received by the Regional Director.

8.   **Preferably**, **not more than one student is permitted to work on a project**. However, in case a project is comprehensive enough that requires one human-year or more time for its completion, then as per requirements of six human-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 MCA Project Coordinator, SOCIS, Block-C, Visveswarayya Bhawan, IGNOU Academic Complex, Maidan Garhi, New Delhi – 110068** by sending the complete synopsis by both the students along with a hand-written application.

9.   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 MCA Project Coordinator along with the synopsis should be sent to the 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.**

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

11.   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

Each and every component of the project work and the viva voce carries its own weightage, so the student needs to concentrate on all the sections given in the project report formulation.

In this section, we have given a few general parameters as checkpoints for the assessment of any software development project. You can note these points and emphasise them during the project report preparation and examination. Basically, assessment will be based on the quality of your report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual effort, you have put into the project. Project execution is concerned with assessing how much work you have put in.

Analysis

In Project planning include cost estimation and project scheduling. The Cost and efforts estimation is 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 is whether you have used some standardisation 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, behaviour model and/or state transition diagram and details of various data structures used.

- The Entity Relationship diagram (ER Diagram) should have:

    o Proper symbol of attributes, entities, relationships, cardinality mentioned,
    and o Relationship of ER diagram to SRS with strong association
- Data Flow Diagram (DFD) should have:

o All Data flow should be levelled and should have proper input and output.
o 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 normalised tables and data integrity and constraints. You should include them with the requirements given below:

- **Program Structure:** It should have the proper modularisations of software and specification of each module.

- **Schema Design and Normalised Tables:** Normalise the table to minimum 3NF. If any demand of Demoralisations 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 standardisation 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.

- **Standardisation 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 developer of the software can then check if the results produced by the software are in accordance with his or her expectations. It includes, number of 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 specification.

It ensures the quality, efficiency and reliability of the software, which is 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. How debugged your code is and what actions you have taken too improve the code, must, be explained. Good testing can be measured by criteria such as correctness, reliability, user friendliness, maintainability, efficiency and portability of software.

System Security Measures

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

Report Generation

The project report should include the various sample reports for ready reference.

Screen Layouts/Screen Shots/Screen dumps

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

Organisation of the Project Report

Report organisation improves the professional attitude of writing reports. You should emphasise on the proper binding of the project report, the cover page, page numbering, organisation of content, and proper printout of text and images.

Viva Voce

In this component of evaluation students get chance to present their knowledge and skill to the expert. Other than the questions related to the project related areas and the courses concerned, student may be requested to show the demo of the project. Also, you may be told to write the portions of the code for a problem to demonstrate her/his coding capabilities.

While appearing for the viva-voce, along with the project report the student should needs to carry the identical copy of the CD of the executable file(s) which s/he submitted at the time of project report.

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 evaluation. A student in order to be declared successful in the project (MCSP-232) must secure **40% marks in each component (i) Project Evaluation and (ii) Vivavoce**. Pass in both the components is compulsory. If a student submitted the project report as per the schedule and fails to attend viva, her/his Project will remains incomplete and should contact the Regional Centre concerned.

Student will be duly intimated about the Viva-voce by a letter from the Regional Director of the concerned Regional Centre. Viva-voce will be held at the Regional centre concerned. In no case the viva-voce would be conducted at the workplace or the residence of the Examiner. Viva-Voce
will be conducted in face-to-face mode.

Unfair means

Students shall not use unfair means in connection with any of the project synopsis or the project report. The University will take the unfair means cases of the project synopsis and project reports seriously and would be referred to 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 pl us, Foxpro, Visual Foxpro and MSAccess. Also, projects should not be developed using the combination of Visual Basic as the front end and MS-Access as the back end. Latest versions of the software are to be used. 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 doesn't involve software development, are strictly not allowed.
(ii) C/C++ languages should not be used for any Information Management System Project, for example, Hospital/Reservation/Library/School/College Management System etc.
(iii) Students can also develop applications using tools/languages/software not listed above, if they are part of latest technologies. 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 : 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: MCA_NEW), 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. Her/His project must be undertaken in a software development Organization/ Industry/Research Laboratory under the supervision of a guide, preferably from the same organization with the educational qualifications and experience mentioned in the MCSP-232 project guidelines. During her/his course of study, the student has studied and gained knowledge on 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 organisation and complete her/his project work. I ensure you a sincere and quality output from him. The experience gained by this project work, not only benefit the student to partially fulfil the requirements of the Master of Computer Applications of IGNOU, but also lay a foundation for her/his future career.

Looking forward to your positive response, support and cooperation.

Signature, Name of the Regional
Director/ARD/DD with Date and Stamp

X. CERTIFICATE OF ORIGINALITY

This is to certify that the project report entitled _____

submitted to **Indira Gandhi National Open University** in partial fulfilment of the requirement

for the award of the degree of **MASTER OF COMPUTER APPLICATIONS,** 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   Name, Designation and
the student   Address of the Guide

……………………..   ………………………..

……………………..   ………………………..

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……………………..   ………………………..

Enrolment No…………

XI SAMPLE COVER PAGE OF THE PROJECT REPORT

INDIRA GANDHI NATIONAL OPEN UNIVERSITY

MCSP - 232

TITLE OF THE PROJECT

by

Student's Full Name
Enrolment No:

Under Guidance
of
Project Guide's Full Name

Submitted to the School of Computer and Information Sciences,

IGNOU in partial fulfilment of the requirements for the award of

the degree

Master of Computer Applications (MCA)

Year of Submission

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