

**MASTER OF  
SCIENCE(INFORMATION SECURITY)  
(MSCIS)**

***MSCIS/ASSIGN/2024***

**ASSIGNMENTS  
JULY2024**

**Semester-III**

**MSE-029, MSE-030, MSE-031, MCS-226 and MSEL-032**

**SCHOOL OF VOCATIONAL EDUCATION AND TRAINING  
INDIRAGANDHINATIONALOPENUNIVERSITY  
MAIDAN GARHI, NEW DELHI – 110 068**

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### **Guidelines regarding submission of assignments**

1. It is compulsory for the students to submit the prescribed assignments. They will not be allowed to appear for the term-end examination of a course if they do not submit the assignments in time for that course.
2. The assignment responses should be complete in all respects. Before submission, the students should ensure that they have answered all the questions in all assignments. Incomplete answer sheets bring poor grades.
3. The University/ Regional Centre have the right to reject the assignments received after the due date. Therefore, the students are advised to submit their assignments before the due date.
4. Students should submit before the last dates prescribed for submission of assignments.
5. In case the students have already done some assignments prescribed in a course, they are required to do the **left-over assignments before taking the Term-end Examination**. If they have qualified in a course on the basis of lesser number of assignments and Term-end Examination, they will **not be eligible to re-do the assignments** with a view to improve the overall qualifying score of that course.
6. In case any student fails to submit the assignments or fails to score minimum qualifying marks, s/he has to wait for fresh assignments meant for the current batch of students.
7. For their own record, students should retain a copy of all the assignment responses, which they submit.
8. Once the students get the pass marks in an assignment, they can not re-submit it for improvement of marks. If the student secured requisite marks in Term-End Examination and Assignments, but did not get requisite overall percentage, then the student can either resubmit the assignment or reappear for the term-end examination for securing the requisite overall percentage.
9. Assignments are not subject to re-evaluation.

### **Instructions for Doing Assignments**

While answering Assignments, the following guidelines are required to be observed:

1. The student should write their Complete correct Enrolment Number, Name, Full Address, Signature and Date on the top right hand corner of the first page of the response sheet.
2. The students should write the Programme Title, Course Code and Course Title on the left hand corner of the first page of their response sheet. Course code may be reproduced from the assignment.

The top of the first page of your response sheet for each assignment should look like this:

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PROGRAMME TITLE: ..... ENROLMENT No.: .....  
COURSE CODE: ..... NAME : .....  
COURSE TITLE: .....  
ADDRESS:.....  
SIGNATURE: .....  
DATE: .....

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3. The students should write the responses in their own hand. **They should not print or type the answers. They should not reproduce their answers from the units sent to them by the University. If they reproduce from units, they will get poor marks for the respective question.**
4. The students should write each assignment separately. All the assignments should not be written in continuity.
5. The students should write the question number with each answer.
6. The students should use only foolscap size paper for their response and tie all the pages carefully. Avoid using very thin paper. They should allow a 4 cm. margin on the left and at least 4 lines in between each answer. This may facilitate the evaluator to write useful comments on the margins at appropriate places.
7. The students should not copy from the response sheets of other students. If copying is noticed, the assignments of such students will be rejected, and disciplinary action can be taken against the students as per rules of the University.
8. Please remember that it is compulsory to send scannedcopies of handwritten assignments through email to the respective Regional Centre email or upload on the link provided on the respective Regional centre's website or the hard copy of handwritten assignments to your concerned Regional centre/Study centre before you can take the Term End Exams or else you will not be issued hall tickets.

**Under no circumstances should they be sent to the (SED) for evaluation.**

<b>Course Code</b>	<b>:</b>	<b>MSE-029</b>
<b>Course Title</b>	<b>:</b>	<b>Cyber Attack: Use of</b>
<b>Technology in Cyberspace</b>		
<b>Maximum Marks</b>	<b>:</b>	<b>100</b>
<b>Weightage</b>	<b>:</b>	<b>30%</b>
<b>Last date of Submission</b>	<b>:</b>	<b>31<sup>st</sup> October, 2024 (For latest update, Pl. check IGNOU's Website)</b>

**Attempt any five questions out of seven questions. Each question carries 20 marks. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.**

**Q1. What do you mean by OSNIT and Information Security? Discuss its tools with examples.**

**Q2:** Explain cyber security at network and application layer of a typical IT system in detail.

**Q3:** Explain penetration testing with processes and methods.

**Q4:** Explain Cyber Attack Recovery Procedure in detail with example.

**Q5:** Describe types of computer networks with a diagram with merits and limitations of each.

**Q6:** Write and explain any five vulnerabilities in software application.

**Q7:** What do you mean by Indicators of Compromise (IoCs). Explain with an example..

<b>CourseCode</b>	:	<b>MSE-030</b>
<b>CourseTitle</b>	:	<b>Cloud and Infrastructure Security</b>
<b>MaximumMarks</b>	:	<b>100</b>
<b>Weightage</b>	:	<b>30%</b>
<b>Lastdateof Submission</b>	:	<b>31<sup>st</sup>October, 2024 (For latest update, Pl. check IGNOU's Website)</b>

**Attempt any five questions out of seven questions. Each question carries 20 marks. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.**

**Q1:** What is Cloud Computing ? How Cloud Computing differs from Cluster Computing , Grid Computing ? Explain the characteristics of Cloud Computing. Also, give benefits & applications of Cloud Computing.

**Q2:** Explain the following types of network connectivity in cloud computing:

1. Public Intercloud Networking
2. Private Intercloud Networking
3. Public Intracloud Networking
4. Private Intracloud Networking

**Q3:** Explain the importance of virtualization in cloud computing? How security is achieved through virtualization? Emulation and isolation are important features of virtualization. Justify the statement.

**Q4:** What is Tenancy in context of cloud computing ? Compare Multi-Tenancy model and Single Tenancy model of resource sharing. Explain the various ways through which Multi-Tenancy can be implemented.

**Q5:** What is an Hypervisor? Describe various hypervisor based virtualization approaches like full virtualization, para virtualization and h/w-assisted virtualization.

**Q6:** Explain the term Resource Provisioning in context of cloud computing. Also, explain the various approaches used for Resource Provisioning. Discuss the problems of Over-provisioning and Under-provisioning.

**Q7:** How to choose appropriate deployment model?

<b>CourseCode</b>	<b>:</b>	<b>MSE-031</b>
<b>CourseTitle</b>	<b>:</b>	<b>Cyber Security using Python</b>
<b>MaximumMarks</b>	<b>:</b>	<b>100</b>
<b>Weightage</b>	<b>:</b>	<b>30%</b>
<b>Lastdateof Submission</b>	<b>:</b>	<b>31<sup>st</sup>October, 2024 (For latest update, Pl. check IGNOU's Website)</b>

**Attempt any five questions out of seven questions. Each question carries 20 marks. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.**

**Q1:** Write stepwise procedure to install python and write minimum system resources required. Also write and explain any five features of Python.

**Q2:** What do you mean by Python Libraries? Give illustration. Also discuss the operating system modules in Python.

**Q3:** Explain the term Packet Sniffing. Differentiate between Active Sniffing and Passive Sniffing. Why is passive sniffing ineffective?

**Q4:** What is social media analysis for information gathering? Explain it with an example.

**Q5:** What are web vulnerabilities? Describe the various types of Injection attacks as web vulnerabilities. Also, list the top ten security vulnerabilities as per OWASP.

**Q6:** Write and explain in detail any five attacks on wi-fi networks scripting (XSS).

**Q7:** (a) Describe Socket Programming in Python.  
(b) Explain the Web scrapping use cases with examples.

<b>CourseCode</b>	<b>:</b>	<b>MCS-226</b>
<b>CourseTitle</b>	<b>:</b>	<b>Data Science and Big Data</b>
<b>MaximumMarks</b>	<b>:</b>	<b>100</b>
<b>Weightage</b>	<b>:</b>	<b>30%</b>
<b>Lastdateof Submission</b>	<b>:</b>	<b>31<sup>st</sup>October, 2024 (For latest update, Pl. check IGNOU's Website)</b>

**This assignment has ten questions of 8 Marks each, answer all questions. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.**

Q1: What is Exploratory Data Analysis (EDA) and why is it important in the data science workflow? What are the key components of the data science process?

Q2: Discuss the implications of hypothesis testing results in decision-making. Provide examples of real-world situations where statistical hypothesis testing is commonly used.

Q3: What is data preprocessing, and why is it a crucial step in the data science workflow? Why is it important to identify and handle outliers in a dataset during data preprocessing?

Q4: Discuss the significance of the three Vs (Volume, Velocity, Variety) in the context of big data. Provide examples of each of the three Vs in real-world scenarios. How does MapReduce facilitate parallel processing of large datasets? Explain the functionality of the Map function in the MapReduce paradigm with the help of an example.

Q5: Explain the purpose of Apache Hive in the Hadoop ecosystem. How does Spark address limitations of the traditional MapReduce model?

Q6: Define NoSQL databases and explain the primary motivations behind their development. Provide examples of scenarios where each type of NoSQL database is suitable.

Q7: How does collaborative filtering contribute to enhancing user experience and engagement in recommendation systems? Provide examples of industries or platforms where collaborative filtering is widely used.

Q8: What is a Data Stream Bloom Filter? Explain its primary purpose in data stream processing. Also, introduce the Flajolet-Martin Algorithm and its role in estimating the cardinality of a data stream.

Q9: Describe the role of link analysis in the PageRank algorithm. How are links between web pages interpreted in the context of PageRank?



Q10: Explain the concept of decision trees in classification. Provide an example of building and visualizing a decision tree using R. How can K-means clustering be applied to a dataset in R?

**CourseCode** : **MSEL-032CourseTitlePractical (Cyber Attacks, Cloud Security, Data Analytics and Data Recovery etc)**  
**Maximum Marks** : **100**  
**Weightage** : **30%**  
**Lastdateof Submission** : **31<sup>st</sup>October, 2024 (For latest update, Pl. check IGNOU's Website)**

**This assignment has two Questions,answer all questions. Each Question is of 20marks.YourLabRecordswillcarry40Marks(20MarksforeachQuestion).Rest 20marksarefor viva voce. You may use illustrations and diagrams to enhance the explanations. Pleasego through the guidelines regarding assignments given in the programme guide for theformatof presentation.**

**Note: You must execute the program and submit the program logic, sample input andoutput along with the necessary documentation. Assumptions can be made wherevernecessary.**

**Q1:**List the steps involved in IT Auditing and Penetration Testing.**(20 marks)**

**Q2:**Describe the findigs of mobile forensics after using AFLogical OSE to perform mobile forensics . **(20 marks)**

Note: Make necessary assumptions if any.