



## Course Specification of Virology (1)

I. Course Identification and General Information:						
1	<b>Course Title:</b>	Virology (1)				
2	<b>Course Number &amp; Code:</b>	MI356				
3	<b>Credit hours:</b>	C.H				Total
		Theoretical	Practical	Training	Seminar	
		1	1	0	0	2
4	<b>Study level/ semester at which this course is offered:</b>	Third Year -First Semester				
5	<b>Pre –requisite (if any):</b>	PH242,PH243				
6	<b>Co –requisite (if any):</b>	None				
7	<b>Program (s) in which the course is offered:</b>	Bachelor's degree (B. Sc.) Veterinary medicine				
8	<b>Language of teaching the course:</b>	English				
9	<b>Location of teaching the course:</b>	Faculty of veterinary medicine				
10	<b>Prepared by:</b>	Dr. Fateh Ali Yahya Badi Dr. Faris Mohammed Ahmed Al-zailay				
11	<b>Date of approval:</b>					

### II. Course description:

The course covers the fundamental principles related to the interaction of mainly animal viruses with host cells and molecular events during viral replication.

General topics include chemical and physical properties of viruses, virus classification, cultivation of viruses, laboratory diagnosis and prevention and control of infection.

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<b>I. Intended learning outcomes (ILOs) of the course:</b>			
<b>(A) Knowledge and Understanding:</b>			
Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: <b>Knowledge and Understanding.</b>			
<b>Program Intended Learning Outcomes (Sub-PILOs) in: Knowledge and Understanding</b>		<b>Course Intended Learning Outcomes (CILOs) in: Knowledge and Understanding</b>	
After completing this program, students will be able to:		After completing this course, students will be able to:	
<b>A1-</b>	Demonstrate knowledge and understanding of concepts and principles of general culture, basic science, and supportive to veterinary medicine.	<b>a1-</b>	Determine the essential concepts of virology which include the structure of different viruses, properties, replication, types of infection
<b>A3-</b>	Identifies various causes of diseases and animal epidemics and how they can be diagnosed, including common diseases that life-threatening of animals, poultry and fish.	<b>a2-</b>	Describe the causes, pathogenesis, clinical symptoms, diagnosis, immune response to infection, treatment and prognosis of the most important viral diseases.
<b>Teaching And Assessment Methods For Achieving Learning Outcomes:</b>			
Alignment of Learning Outcomes of Knowledge and Understanding to Teaching and Assessment Methods:			
<b>Course Intended Learning Outcomes (CILOs) in Knowledge and Understanding</b>		<b>Teaching strategies/methods to be used</b>	<b>Methods of assessment</b>
completing this course, students will be able to:		-Lectures using board, data shows and multimedia aids. - brainstorm. - discussion. -Self-learning by preparing essay and presentations (computer and faculty library) -Practical training (Clinical demonstrations, practice of skills, and discussions). - Laboratories visits	-Written exam -Practical exam -Oral exam - Quizzes - Report assignments - Discussion
<b>a1-</b>	Determine the essential concepts of virology which include the structure of different viruses, properties, replication, types of infection		
<b>a2-</b>	Describe the causes, pathogenesis, clinical symptoms, diagnosis, immune response to infection, treatment and prognosis of the most important viral diseases.		

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**(B) Intellectual Skills:**

**Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Intellectual skills**

Program Intended Learning Outcomes (Sub-PILOs) in Intellectual skills		Course Intended Learning Outcomes (CILOs) of Intellectual Skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
<b>B2-</b>	Predicts an appropriate medical diagnosis for the most common disease states through analysis of clinical story data and the results of medical examinations of sick animal.	<b>b1-</b>	Correlate between different diseases and viruses associated with them to reach to final diagnosis.
<b>B4-</b>	Determine appropriate and effective treatment evaluates all medications used for each diseased condition.	<b>b2-</b>	Select the suitable sample and the suitable laboratory test for diagnosis.

**Teaching And Assessment Methods For Achieving Learning Outcomes:**

**Alignment of Learning Outcomes of Intellectual Skills to Teaching Methods and Assessment Methods:**

Course Intended Learning Outcomes (CILOs) in Intellectual Skills.		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:			
<b>b1-</b>	Correlate between different diseases and viruses associated with them to reach to final diagnosis.	- Lectures using board, data shows and multimedia aids. - brainstorm. - discussion. - Self-learning by preparing essay and presentations (computer and faculty library) - Practical training (Clinical demonstrations, practice of skills, and discussions). - laboratories visits	-Written exam -Practical exam -Oral exam - Quizzes - Report assignments - Discussion
<b>b2-</b>	Select the suitable sample and the suitable laboratory test for diagnosis.		

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**(C) Professional and Practical Skills:**

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **Professional and Practical Skills**

Program Intended Learning Outcomes (Sub-PILOs) in Professional and Practical Skills		Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
C3-	Reads the results of laboratory investigations and diagnostic scans and writes reports and prescriptions for all common cases in a proper way.	c1-	Perform some serological tests used for detection of viral antigens in clinical samples and analyze the results.
C4-	Treats of animal patients safely and effectively taking into account the evaluation of the results, the appropriate modification of the treatment plan and the accurate description of the appropriate medications.	c2-	Practice different methods used for isolation of viruses and their identification.

**Teaching And Assessment Methods For Achieving Learning Outcomes:**

Alignment of Learning Outcomes of Professional and Practical Skills to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:			
c1-	Perform some serological tests used for detection of viral antigens in clinical samples and analyze the results.	-Practical training (Clinical demonstrations, practice of skills, and discussions). - Laboratories visits	Written exam -Practical exam -Oral exam - Quizzes - Report assignments - Discussion
c2-	Practice different methods used for isolation of viruses and their identification.		

**(D) General / Transferable Skills:**

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **General and Transferable skills**

Program Intended Learning Outcomes (PILOs) in	Course Intended Learning Outcomes (CILOs) in
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General / Transferable skills		General / Transferable skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
D1-	Communicates effectively with Professional colleagues and animal owners and expresses his ideas clearly and objectively.	d1-	Use simple word and IT skills (i.e., data processing, software, internet, and multimedia) and the library to find information.
D3-	Practices problem-solving, negotiation, supervision and veterinary medical management skills and writing research reports efficiently and professionally.	d2-	Work in team (i.e., sharing presentations and discussions and solving problem).

**Teaching And Assessment Methods For Achieving Learning Outcomes:**

**Alignment of Learning Outcomes of General and Transferable skills to Teaching and Assessment Methods:**

Course Intended Learning Outcomes (CILOs) in General and Transferable Skills		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		-Self-learning by preparing essay and presentations (computer and faculty library) - Scientific visits - discussions - Assignments	-Written exam -Practical exam -Oral exam - Report assignments - Discussion - Note performance
d1-	Use simple word and IT skills (i.e., data processing, software, internet, and multimedia) and the library to find information.		
d2-	Work in team (i.e., sharing presentations and discussions and solving problem).		

**II. Course Content:**

**1 – Course Topics/Items:**

**a – Theoretical Aspect**

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1	Introduction, discovery of viruses	a1, a2, b1, b3, c2, c3	History and Definition of viruses	1	1
2	Structure and morphology of viruses	a1, a2, a4, a5, b3, b4, b5, c3, c4, c6	Chemical composition of viruses	1	1
3	Classification of viruses	a1, a2, a4, a5, b3, b4,	Viral taxonomy and	1	1

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		b5, c3, c4, c6	nomenclature		
4	Replication of viruses	a1, a2, a4, a5, b3, b4, b5, c3, c4, c6		1	1
5	Viral proteins and virus genetics	a1, a2, a4, a5, b3, b4, b5, c3, c4, c6		1	1
6	Viral oncogenesis	a1, a2, a4, a5, b3, b4, b5, c3, c4, c6		1	1
7	Virus transmission	a1, a2, a3, b5, c1, c4, d3, d4, d6	Virus-host cell interactions	1	1
8	Immune response to viruses	a2, a3, a5, d5, d6		1	1
9	Viral pathogenesis	a2, a3, a5, d5, d6		1	1
10	Stability of viral infectivity	a2, a3, a5, d5, d6		1	1
11	Anti-viral therapy	a2, a3, a4, a5, d1, d2, d3, d5		1	1
12	Control of viral infection	a2, a3, a4, a5, d1, d2, d3, d5	Vaccines and vaccination	1	1
13	Laboratory biosafety	a1, a2, a3, b1, b2, b4, b5, c1, c4, d3		1	1
14	Laboratory biosecurity	a1, a2, a3, b1, c4, d3		1	1
<b>Number of Weeks /and Units Per Semester</b>				<b>14</b>	<b>14</b>

**b- Training Aspect:**

Order	Training Tasks	CILOs (symbols)	Number of weeks	Contact hours
1	Key elements of a virology laboratory	a1, b2, b4, b5, c1, c2, d1, d2, d3, d4, d5, d6	1	1
2	Safety Orientation	a2, b2, b5, c1, c4, d1, d3, d5	1	1
3	Diagnosis of viral diseases	a1, a2, b1, c1, c3, c4, c5, c6, d3, d5, d6	1	1
4	Collection, preservation and transport of virus containing specimens	a1, b1, b3, b4, b5, c1, c2, c3, c4, d3, d5	1	1

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5	Electron microscopy examination	a5, b1, b2, b4, b5, c1, c3, c4, d6	1	1
6	Sample preparation for virus isolation	a1, b1, b3, b4, b5, c1, c2, c3, c4, d3, d5	1	1
7	Cultivation of viruses in laboratory animal's	a1, a2, a3, a5, b2, b3, b4, b5, c1, c2, c3, c4, c5, c6, d3	1	1
8	Cultivation of viruses in chicken Embryos	a1, a2, a3, a5, b2, b3, b4, b5, c1, c2, c3, c4, c5, c6, d3	1	1
9	Preparation of cell culture	a1, b1, b3, b4, b5, c1, c2, c3, c4, d3, d5	1	1
10	Cultivation of viruses in cell culture	a1, a2, a3, a5, b2, b3, b4, b5, c1, c2, c3, c4, c5, c6, d3	1	1
11	Recognition of viral growth in cell culture (cytopathic effect (CPE) and heamadsorbtion	a5, b1, b2, b4, b5, c1, c3, c4, c5, d6	1	1
12	Hemagglutination test	a5, b1, b2, b4, b5, c1, c3, c4, c5, d6	1	1
13	Hemagglutination inhibition	a5, b1, b2, b4, b5, c1, c3, c4, c5, d6	1	1
14	Titration techniques	a5, b1, b2, b4, b5, c1, c3, c4, d6	1	1
<b>Number of Weeks /and Units Per Semester</b>			<b>14</b>	<b>14</b>

**III. Teaching strategies of the course:**

- Lectures and practical of every topic in the course.
- Collection of some information from textbooks.
- Institute laboratory visits, vaccine production company visit.

**3-Assessment Methods:**

- Written Mid-term To assess the skills of ability to remember and understand
- Written Final-term To assess the skills of ability to remember and understand
- Practical Final-term To assess professional and practical skills
- Oral Final-term To assess skills of discussion

**I. Schedule of Assessment Tasks for Students During the Semester:**

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs)
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					symbols)
1	Participation, quizzes and assignments	2-14	10	10%	a1, a2, a3, a5, b2, b3, b4, b5, c1, c2, c3, c4, c5, c6, d3
2	Mid-Term Exam	8	10	10%	a1, a2, a3, a5, b2, b3, b4, b5, c1, c2, c3, c4, c5, c6, d3
3	Mid-Term Practical Exam	8	10	10%	a1, a2, a3, a5, b2, b3, b4, b5, c1, c2, c3, c4, c5, c6, d3
4	Final Practical Exam	15	10	10%	a1, a2, a3, a5, b2, b3, b4, b5, c1, c2, c3, c4, c5, c6, d3
5	Oral Exam	15	5	5%	a1, a2, a3, a5, b2, b3, b4, b5, c1, c2, c3, c4, c5, c6, d3
6	Final Exam	16	55	55%	a1, a2, a3, a5, b2, b3, b4, b5, c1, c2, c3, c4, c5, c6, d3
<b>Total</b>			<b>100</b>	<b>100%</b>	

### I. Students' Support:

Office Hours/week	Other Procedures (if any)
From Saturday to Wednesday at 8:00 a.m. till 2 p.m.	Student can contact with me via e-mail

### IV. Learning Resource (MLA style or APA style)S:

<b>1- Required Textbook(s) ( maximum two )</b>	
	- Printed departmental notes by staff members
<b>2- Recommended Readings and Reference Materials</b>	
	1- Clinical veterinary Microbiology (P.G. Quinn).
<b>3- Essential References</b>	
	- Clinical veterinary Microbiology (P.G. Quinn).
	- Veterinary Microbiology (P.G. Quinn).

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	<ul style="list-style-type: none"> <li>- Veterinary Microbiology (Dwight C. Hirsh)</li> <li>- Veterinary Immunology (Ivan Tizard).</li> <li>- Clinical Immunology (Catherine Sheehan).</li> </ul>
<b>4- Electronic Materials and Web Sites etc.</b>	
	<ul style="list-style-type: none"> <li>- <a href="http://WWW.PubMed.com">WWW.PubMed.com</a></li> <li>- <a href="http://www.ncbi.nlm.nih.gov">www.ncbi.nlm.nih.gov</a></li> <li>- <a href="http://www.Vet.net.com">www.Vet.net.com</a></li> <li>- <a href="http://www.Science Direct web site">www.Science Direct web site</a></li> </ul>
<b>5- Other Learning Material:</b>	
	<ul style="list-style-type: none"> <li>- <b>Department notes:</b> available for students to purchase from the department.</li> <li>- White board, overhead projector and data show presentations used during teaching.</li> <li>- Laboratory , apparatus, Chemicals, glasses reagents and media, Kits</li> </ul>

<b>X. Course Policies:</b>	
<b>1</b>	<b>Class Attendance:</b> Mandatory to attend all course lectures
<b>2</b>	<b>Tardiness:</b> Not allowed at all. Students must be in class or in the practical session 10 minutes prior to the beginning of lectures or practical session
<b>3</b>	<b>Exam Attendance/Punctuality:</b> Attendance is mandatory; absence is accepted with valid excuse
<b>4</b>	<b>Assignments &amp; Projects:</b> All assignments and projects are to be submitted on their due date. Any assignment turned in after the due date will not be accepted without valid and reasonable excuse
<b>5</b>	<b>Cheating:</b> Not tolerated and may lead to <b>EXPELLING</b> the student from the program
<b>6</b>	<b>Plagiarism:</b> Not tolerated <b>AT ALL</b> and may lead to <b>EXPELLING</b> the student from the program
<b>7</b>	<b>Other policies:</b> <ol style="list-style-type: none"> <li>1. All devices must be on silent or at least on vibration during lectures/labs</li> <li>2. Before any exam (written, oral) we must check student's identity (student's card, ID,</li> </ol>

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passport). Without any of these documents, the student will not be allowed in the exam room.

3. Any of type/ form of cheating is not allowed no matter what.
4. Maintain silence during lectures/exam and disturbance is not allowed. For any questions students should raise their hand and wait for permission to talk.

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## Course Plan of Virology (1)

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Dr. Fateh A. Y. Badi Dr. Faris M. A. Al-zailay	Office Hours					
Location & Telephone No.	Dhamar Governorate 770667223	SAT	SUN	MON	TUE	WED	THU
E-mail	<a href="mailto:Farisvet4@gmail.com">Farisvet4@gmail.com</a>	8am 2pm	8am 2pm	8am 2pm	8am 2pm	8am 2pm	-

II. Course Identification and General Information:						
1-	Course Title:	Virology (1)				
2-	Course Number & Code:	MI356				
3-	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		1	-	1		2
4-	Study level/year at which this course is offered:	Third Year -First Semester				
5-	Pre –requisite (if any):	PH242,PH243				
6-	Co –requisite (if any):	None				
7-	Program (s) in which the course is offered	Bachelor's degree (B. Sc.) Veterinary medicine				
8-	Language of teaching the course:	English				
9-	System of Study:	Regular / Semester				
10-	Mode of delivery:	Lecturers, practical laboratory works				
11-	Location of teaching the course:	Faculty of veterinary medicine				

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### III. Course Description:

This course covers the fundamental principles related to the interaction of mainly animal viruses with host cells and molecular events during viral replication.

General topics include chemical and physical properties of viruses, virus classification, cultivation of viruses, laboratory diagnosis and prevention and control of infection.

### IV. Intended learning outcomes (ILOs) of the course:

After completing this course, students will be able to:

- a1- Determine the essential concepts of virology which include the structure of different viruses, properties, replication, types of infection
- a2- Describe the causes, pathogenesis, clinical symptoms, diagnosis, immune response to infection, treatment and prognosis of the most important viral diseases.
- b1- Correlate between different diseases and viruses associated with them to reach to final diagnosis .
- b2- Select the suitable sample and the suitable laboratory test for diagnosis.
- c1- Perform some serological tests used for detection of viral antigens in clinical samples and analyze the results.
- c2- Practice different methods used for isolation of viruses and their identification.
- d1- Use simple word and IT skills (i.e., data processing, software, internet, and multimedia) and the library to find information.
- d2- Work in team (i.e., sharing presentations and discussions and solving problem).

### V. Course Content:

#### A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Introduction, discovery of viruses	1	1

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2	Structure and morphology of viruses	2	1
3	Classification of viruses	3	1
4	Replication of viruses	4	1
5	Viral proteins and virus genetics	5	1
6	Viral oncogenesis	6	1
7	Virus transmission	7	1
8	Mid-Term Exam	8	1
9	Immune response to viruses	9	1
10	Viral pathogenesis	10	1
11	Stability of viral infectivity	11	1
12	Anti-viral therapy	12	1
13	Control of viral infection	13	1
14	Laboratory biosafety	14	1
15	Laboratory biosecurity	15	1
16	Final Exam	16	1
<b>Number of Weeks /and Units Per Semester</b>		<b>16</b>	<b>16</b>

**b- Training Aspect:**

Order	Training Tasks	Week Due	Contact hours
1	Key elements of a virology laboratory	1	1
2	Safety Orientation	2	1
3	Diagnosis of viral diseases	3	1
4	Collection, preservation and transport of virus containing specimens	4	1
5	Electron microscopy examination	5	1
6	Sample preparation for virus isolation	6	1

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7	Cultivation of viruses in laboratory animal's	7	1
8	Mid-Term Exam	8	1
9	Cultivation of viruses in chicken Embryos	9	1
10	Preparation of cell culture	10	1
11	Cultivation of viruses in cell culture	11	1
12	Recognition of viral growth in cell culture (cytopathic effect (CPE) and hemadsorption	12	1
13	Hemagglutination test	13	1
14	Hemagglutination inhibition	14	1
15	Titration techniques	15	1
16	Final Exam	16	1
<b>Number of Weeks /and Units Per Semester</b>		<b>16</b>	<b>16</b>

**VI. Teaching strategies of the course:**

- Lectures depending on the sharing efforts of the students and supported with macromedia and multimedia aids.
- Training visits to dairy farms as well as milk processing plants.
- Practical sections: Laboratory examination of milk, milk products, by chemical and microbiological methods.
- Self-learning (Electronic learning, Seminars, scientific search on related websites, international, national and local journals, related books in faculty library).
- Summer training course.
- Assays and reviews.  
Discussion groups.

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### VII. Assessment Methods:

- Written examination: For assessment of knowledge, back calling and Intellectual skills.
- Practical examination: For assessment of practical and professional skill.
- Oral examination: For assessment of knowledge and Intellectual skills.
- Student activities: For assessment of knowledge and general and transferable skills.

No.	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Participation, quizzes & assignments	All	10	10%
2	Mid-Term Exam	8 <sup>th</sup>	10	10%
3	Mid-Term Practical Exam	8 <sup>th</sup>	10	10%
4	Final Practical Exam	15 <sup>th</sup>	10	10%
5	Oral Exam	15 <sup>th</sup>	5	5%
6	Final Exam	16 <sup>th</sup>	55	55%
<b>Total</b>			<b>100</b>	<b>100%</b>

### VIII. Learning Resources:

#### 1- Required Textbook(s) ( maximum two ).

- Printed departmental notes by staff members
- Clinical veterinary Microbiology (P.G. Quinn).

#### 2- Essential References.

- Veterinary Microbiology (P.G. Quinn).
- Veterinary Microbiology (Dwight C. Hirsh)
- Veterinary Immunology (Ivan Tizard).
- Clinical Immunology (Catherine Sheehan).

#### 3- Electronic Materials and Web Sites etc.

- [WWW.PubMed.com](http://WWW.PubMed.com)
- [www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov)
- [www.Vet.net.com](http://www.Vet.net.com)
- [www.Science Direct web site](http://www.Science Direct web site)

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<b>XI. Course Policies:</b>	
<b>1</b>	<b>Class Attendance:</b> Mandatory to attend all course lectures
<b>2</b>	<b>Tardiness:</b> Not allowed at all. Students must be in class or in the practical session 10 minutes prior to the beginning of lectures or practical session
<b>3</b>	<b>Exam Attendance/Punctuality:</b> Attendance is mandatory; absence is accepted with valid excuse
<b>4</b>	<b>Assignments &amp; Projects:</b> All assignments and projects are to be submitted on their due date. Any assignment turned in after the due date will not be accepted without valid and reasonable excuse
<b>5</b>	<b>Cheating:</b> Not tolerated and may lead to <b>EXPELLING</b> the student from the program
<b>6</b>	<b>Plagiarism:</b> Not tolerated <b>AT ALL</b> and may lead to <b>EXPELLING</b> the student from the program
<b>7</b>	<b>Other policies:</b> <ol style="list-style-type: none"> <li>1. All devices must be on silent or at least on vibration during lectures/labs</li> <li>2. Before any exam (written, oral) we must check student's identity (student's card, ID, passport). Without any of these documents, the student will not be allowed in the exam room.</li> <li>3. Any of type/ form of cheating is not allowed no matter what.</li> <li>4. Maintain silence during lectures/exam and disturbance is not allowed. For any questions students should raise their hand and wait for permission to talk.</li> </ol>

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