

KATHMANDU UNIVERSITY
End Semester Examination
August, 2019

Mark Scored:

Level : B. Arch.
Year : I

Course : ARCH 161
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date **AUG 09 2019**

SECTION "A"

[20Q × 0.5 = 10 marks]

Encircle the most appropriate answer.

- The maximum strength to stone masonry is obtained by placing the applied load :
A. Perpendicular to the direction of the natural bed of stone
B. Along the direction of the natural load of stone
C. Both of A and B some time
D. Neither A nor B
- The Percentage absorption of water of good stone by weight after 24 hours should not exceed:
A. 0.5 B. 0.6 C. 0.7 D. 0.4
- In cold regions, porous stones are not to be used at places subjected to:
A. Frost B. Moisture C. Both A and B D. Neither A nor B
- Which one of the following sequence of steps is correct for preparing the clay for making bricks?
A. Weathering – Blending – Tempering B. Blending – Tempering – Weathering.
C. Tempering – Weathering – Blending D. None of these is correct.
- What should be placed at the beginning of every Header course in English Bond to avoid vertical joint?
A. Queen closer B. Half bat C. Three fourth bat D. King closer
- Which of the following pairs is matched properly?
A. Class A - Concrete work B. Class B – Mortar
C. Class C – masonry work D. Class D – white washing
- What is the Specialty of Hydraulic lime?
A. Contains impurities B. Does not set under water
C. Contains clay D. Perfectly white in colour
- The hydraulic lime resembles the natural cement if clay content is:
A. 15% B. 20% C. 25% D. 30%
- When water is added to cement, the decreasing rate of reaction of the four minerals is as under:
A. $C_3A \rightarrow C_4AF \rightarrow C_3S \rightarrow C_2S$ B. $C_4AF \rightarrow C_3S \rightarrow C_2S \rightarrow C_3A$
C. $C_3S \rightarrow C_2S \rightarrow C_3S \rightarrow C_4AF$ D. $C_3A \rightarrow C_4AF \rightarrow C_2S \rightarrow C_3S$

10. The strength of concrete is assumed a full strength after:
 A. 7 days B. 14 days C. 21 days D. 28 days
11. If 'P' is the percentage of water required for normal consistency, water to be added for determination of initial setting time, is
 A. 0.70 P B. 0.75 P C. 0.80 P D. 0.85 P
12. Which of the following statements is correct?
 A. Excess of alumina in the clay makes the brick brittle and weak.
 B. Excess of alumina in the clay makes the brick crack and warp on drying.
 C. Excess of alumina in the clay leaves high power deposit on the brick.
 D. Excess of alumina in the clay improves impermeability and durability of the brick.
13. For the manufacture of Portland cement the proportions of raw material used are
 A. Lime 63%; silica 22%; other ingredients 15%
 B. Silica 22%; lime 63%; other ingredients 15%
 C. Silica 40%; lime 40%; other ingredients 40%
 D. Silica 70%; lime 20%; other ingredients 20%
14. Quick setting cement is produced by adding
 A. Less amount of gypsum in very fine powdered form
 B. More amount of gypsum in very fine powdered form
 C. Aluminum sulphate in very fine powdered form
 D. Pozzolana in very fine powdered form
15. Pick up the correct statement from the following.
 A. Adding 5% to 6% moisture content by weight, increases the volume of dry sand from 18% to 38%
 B. The bulking of fine sand is more than that of coarse sand
 C. If the percentage content of moisture exceeds 10%, increase in bulk of sand starts increasing
 D. All options are correct
16. Durability of concrete is proportional to
 A. Cement- aggregate ratio B. Sand content
 C. Water- cement ratio D. Aggregate ratio
17. If 50 kg of fine aggregates and 100 kg of coarse aggregates are mixed in a concrete whose water cement ratio is 0.6, the weight of water required for harsh mix is
 A. 8 kg B. 10 kg C. 12 kg D. 14 kg
18. Under constant load the Creep strain in concrete is
 A. Time dependent B. Temperature dependent
 C. Moisture dependent D. None of these
19. If 1500 g of water is required to have 1875 g cement paste of normal consistency, the percentage of water is
 A. 20% B. 25% C. 30% D. 35%
20. Slate and marble stone belong to
 A. Igneous rocks B. Metamorphic rocks
 C. Sedimentary rocks D. Foliated rocks

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F. M. : 40

SECTION "B"

Attempt ALL questions. Assume the suitable data wherever necessary.

1. Describe briefly the properties of building materials. Explain the difference between Rubble with Ashlar stone masonry with neat sketch. Briefly explain the classification of rocks with examples. [2+2+2]
2. Explain briefly the harmful ingredients in good brick earth, stating their effects on the properties of the bricks? Explain the function of constituents of brick earth. Explain the difference between English bonds with Flemish bond. [2+2+2]
3. Explain bulking of sand with neat schematics diagram. Explain the manufacturing process of lime with flow diagram. Describe the effect of properties of aggregate while preparing the concrete. [2+2+2]
4. What is the physical significance of initial and final setting time of cement? Mention recommended slump of concrete for different purpose of construction, explain taking slump cone test as a reference. Discuss at length the manufacturing process of ordinary cement with flow diagram. [1+2.5+2.5]
5. How the volumetric change in concrete occurs due to the impact of aggregate, water cement ratio, member size and Medium Ambient conditions on shrinkage of concrete. With the help of neat schematic curve, describe the creep phenomena and its recovery. Also discuss the factor affecting the creep of concrete. [3+3]
6. Define normal consistency of cement. Using I.S Method, design a concrete mix for reinforced concrete structure using Ordinary Portland cement of grade 43 with 28 days strength 51 N/mm^2 and the Characteristic compressive strength of the concrete required in field at 28 days is 35 MPa , if the super plasticizer is used as a chemical admixture. Assume the suitable grade of concrete for given condition. [1+4]
Fine aggregate zone-III
Design mix target slump = 175 mm
Maximum nominal size of aggregates = 20 mm (Crushed Angular)
Sp. gravity of Coarse aggregate = 2.82
Exposure Condition = Moderate
Degree of supervision = Good
Sp. gravity of fine aggregate = 2.65
Sp. gravity of cement = 2.93
Sp. Gravity of admixture = 1.2
Entrapped air = 2%
Water content = 186 liters (per cubic meter of concrete for 20 mm size of aggregate)

7. Write short notes on: (ANY TWO)

[2.5 × 2 = 5]

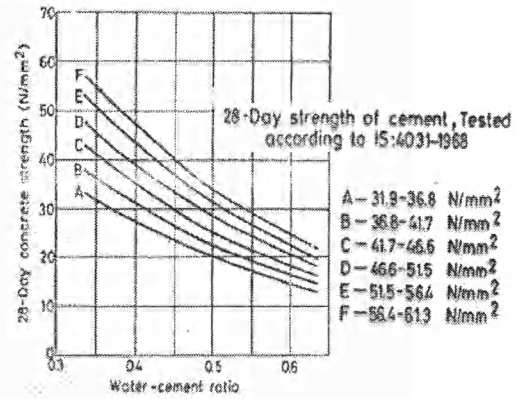
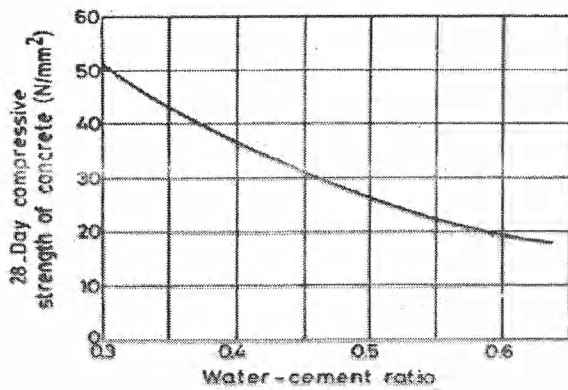
- a) Describe C-S-H gel
- b) Seasoning of stone
- c) Curing of concrete

Table 1 Assumed Standard Deviation
(Clauses 3.2.1.2, A-3 and B-3)

Sl No. (1)	Grade of Concrete (2)	Assumed Standard Deviation N/mm ² (3)
i)	M 10	3.5
ii)	M 15	
iii)	M 20	4.0
iv)	M 25	
v)	M 30	5.0
vi)	M 35	
vii)	M 40	
viii)	M 45	
ix)	M 50	
x)	M 55	

Table 3 Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate
(Clauses 4.4, A-7 and B-7)

Sl No. (1)	Nominal Maximum Size of Aggregate mm (2)	Volume of Coarse Aggregate ¹⁾ per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate			
		Zone IV (3)	Zone III (4)	Zone II (5)	Zone I (6)
i)	10	0.50	0.48	0.46	0.44
ii)	20	0.66	0.64	0.62	0.60
iii)	40	0.75	0.73	0.71	0.69



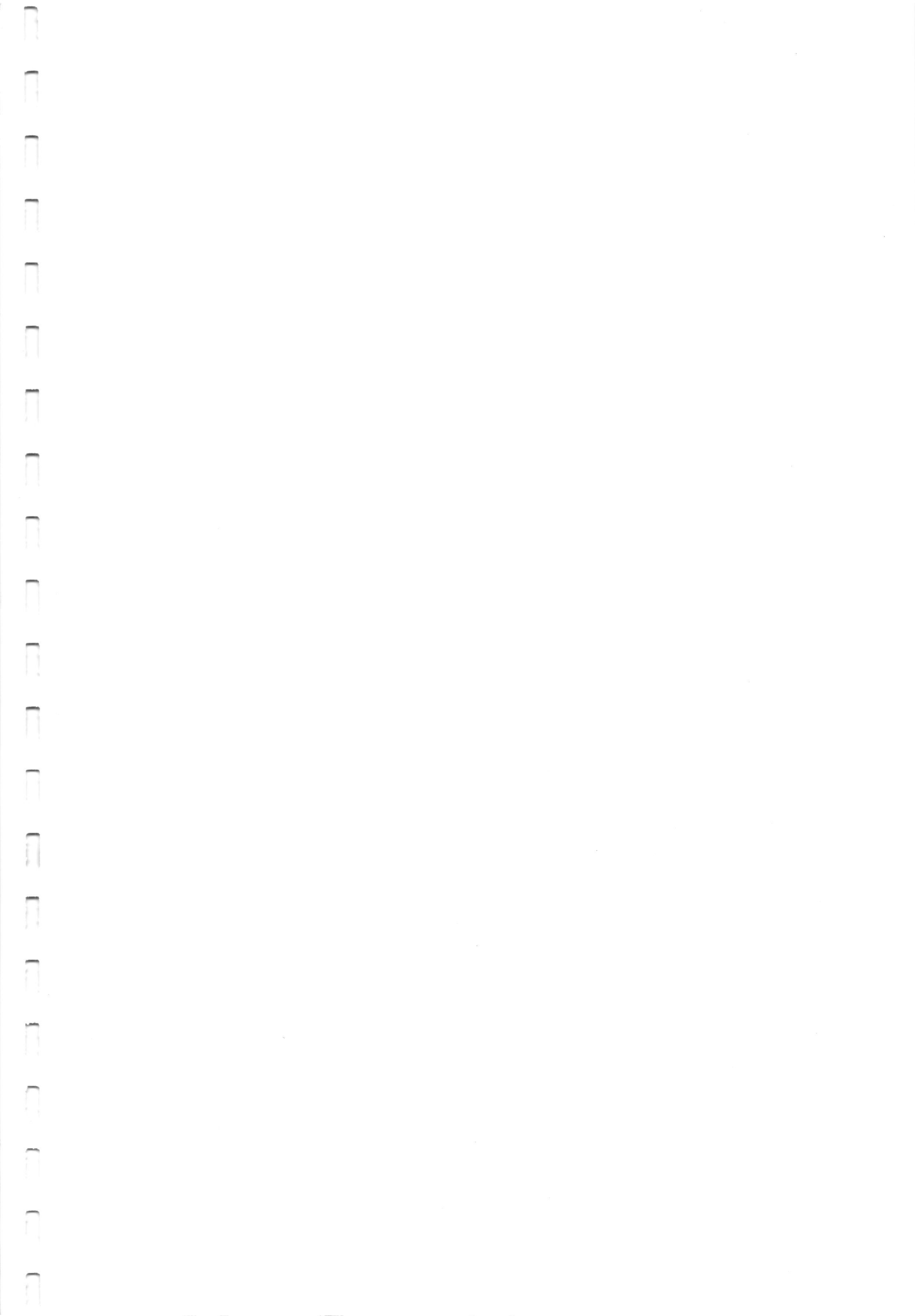
Re-schedule

KATHMANDU UNIVERSITY End-Semester Examinations August, 2019

Examination Time : 11.00 A. M. to 2.00 P. M.

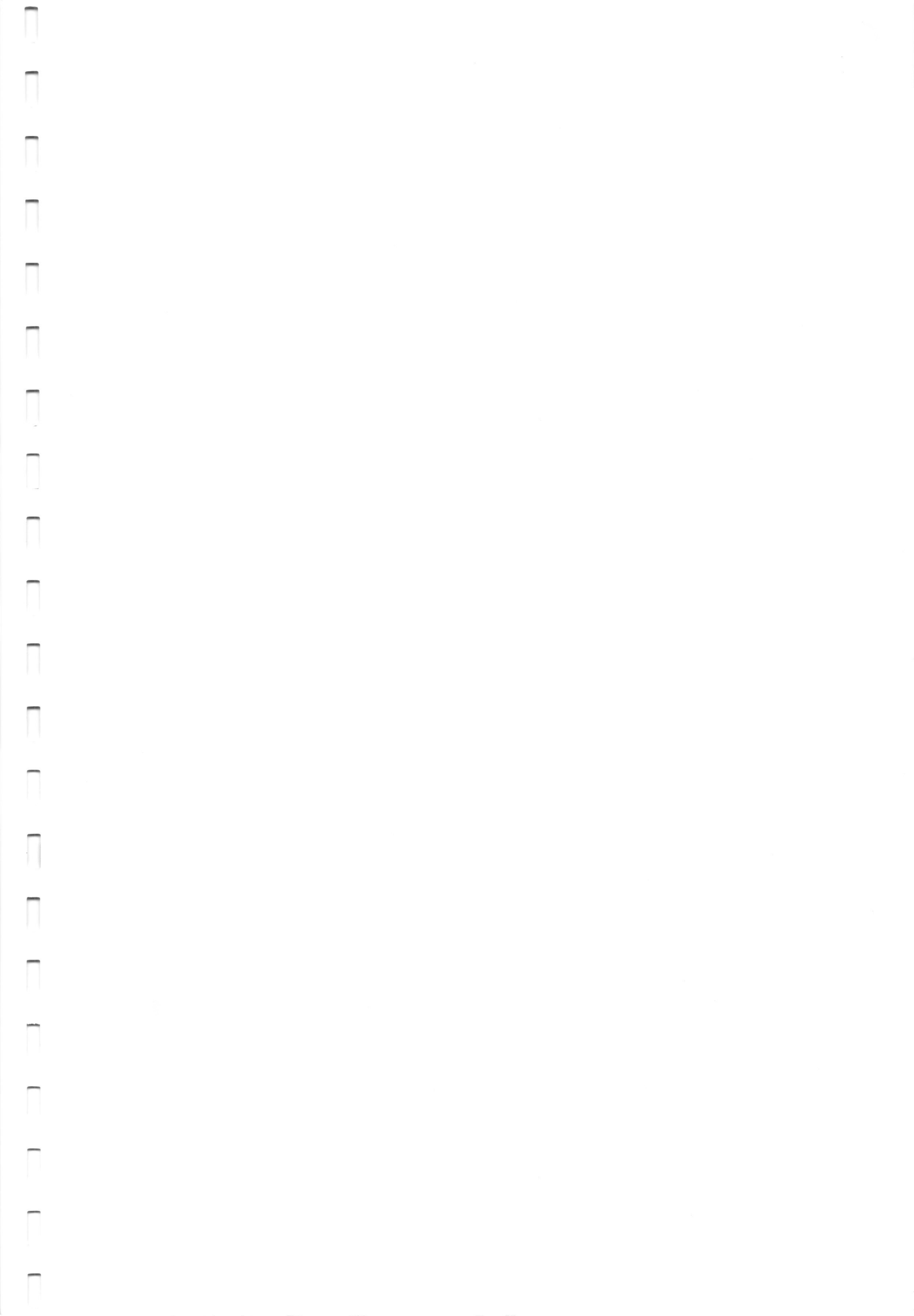
Date	Day	I - II	II - II	III - II	IV - I
August 9	Friday	PHYS 102 ARCH 161		EEEG 309 MEEG 309 MEEG 317 COMP 302 GEOM 315 CIEG 308 ENVS 335 PHAR 311 BIOT 306 PHYS 311 CHEG 314	
August 11	Sunday		MATH 208 ENVS 224 PHAR 212 BIOT 210 PHYS 213 ARCH 215 MATH 211		
August 12	Monday	ENVE 101 CHEM 102		GEOM 313 CHEG 312	MGTS 403
August 13	Tuesday	ARCH 112		ETEG 301 EPEG 301 MEEG 308 COMP 314 CIEG 309 MGTS 302 BIOT 307 PHYS 312 ENVS 318 ENVS 345	
August 14	Wednesday		EEEG 214 MEEG 202 COMP 232 GEOM 206 CIEG 208 BIOL 207 BIOL 206 BIOT 209 CHEG 211 ARCH 216 PHYS 212		

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Date	Day	I - II	II - II	III - II	IV - I
August 16	Friday	ENGG 112 ENVS 101 PHAR 111 BIOT 101 NEPT 101		EPEG 315 EPEG 303 COMP 341 CIEG 312 CHEG 310 PHAR 313 BIOT 308 ENVS 303 ENVE 311	COMP 401
August 18	Sunday		EEEG 215 MEEG 206 COMP 231 CEEG 201 CIEG 206 CHEM 212 PHYS 211 CHEG 213 MATH 213 ARCH 217	MGTS 303 PHYS 313 GEOM 310	
August 19	Monday			EPEG 304 EPEG 318 CHEG 305 COMP 304 COMP 409 ENVS 306	
August 20	Tuesday	MATH 104 MATH 102 MATH 103 MATH 106		CIEG 314 PHAR 315 BIOT 309	
August 21	Wednesday		PHYS 207	MEEG 302	COMP 472
August 22	Thursday		MCSC 202 CHEM 203 BIOT 207 ARCH 218	CHEG 313 PHYS 314 GEOM 306 ENVS 331	
August 23	Friday	ENGT 102		COEG 301 ETEG 305 MEEG 306 COMP 306 MATH 322 CIEG 313 CIEG 318 BIOT 305	
August 25	Sunday		CIEG 207 PHAR 214	GEOM 307 PHAR 316 ENVS 337	

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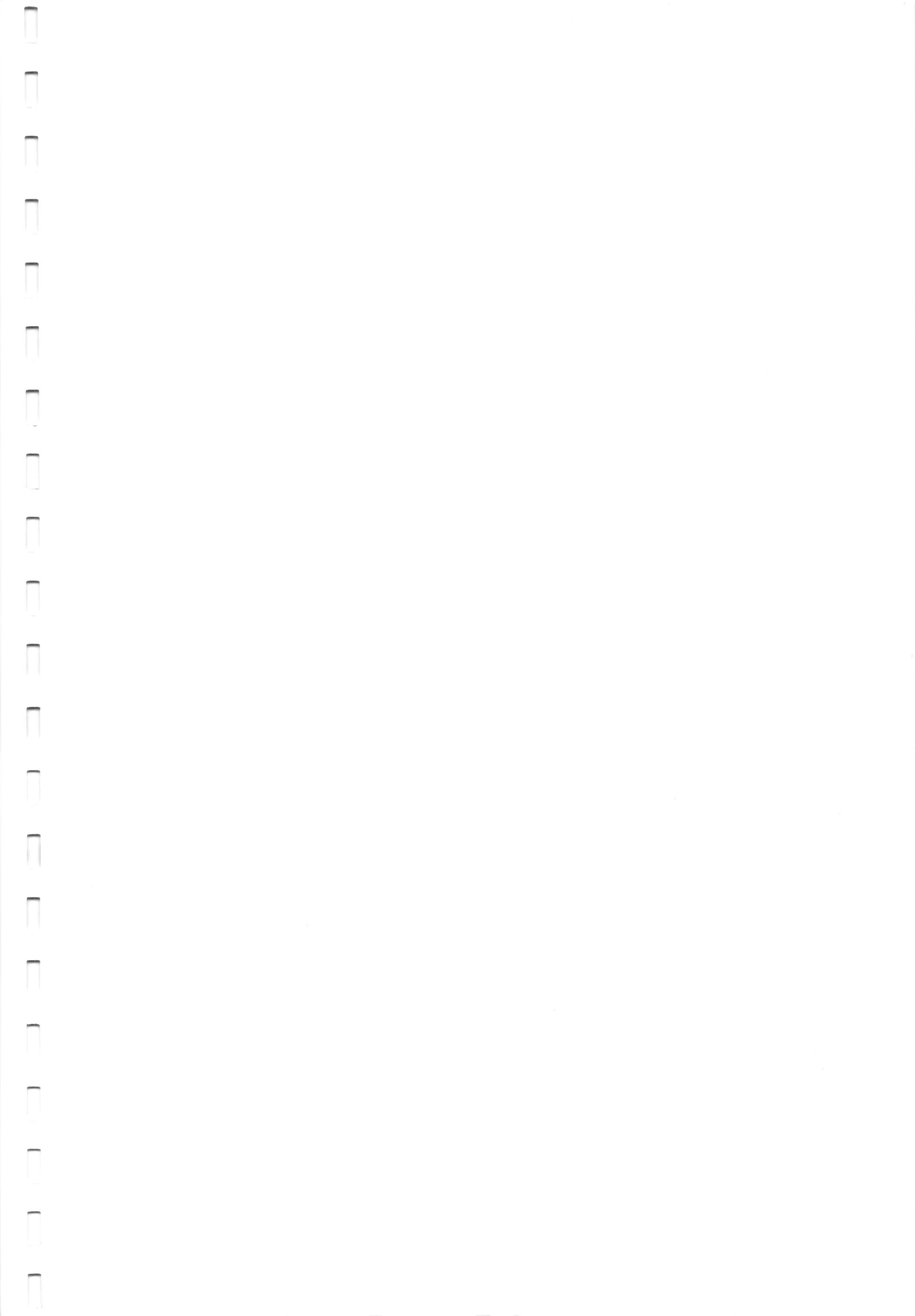


Date	Day	I - II	II - II	III - II	IV - I
August 26	Monday		COMP 201 MEEG 207 COMP 204 BIOT 206 STAT 221 CHEG 210 ENVS 204	INAN 301	COMP 484
August 27	Tuesday	COMP 116 COMP 102 STAT 101		COMP 342 COMP 323 CIEG 310	
August 28	Wednesday		INAN 211	GEOM 319 MEEG 318 ENVS 336	
August 29	Thursday		CIEG 209 GEOM 204 ENVE 205 CHEG 212	CHEG 315 CHEG 323	
August 30	Friday		MATH 207 BIOT 208 MATH 217	ENVE 399	COMP 478

Note: Examinations will be conducted as per this schedule and under no circumstance the dates and times will be changed unless the University publishes prior notice.

Holiday: August 15, 2019: Janai Purnima

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KATHMANDU UNIVERSITY

OFFICE OF THE CONTROLLER OF EXAMINATIONS

Dhulikhel, P.O. Box 6250, Kathmandu, Nepal

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August 11, 2019

NOTICE

As per the recommendation from the DEAN of School of Science and School of Engineering and HoDs of respective departments, the courses (EPEG 315, ETEG 303, GEOM 204, GEOM 206, GEOM 319, CHEG 305 and ENVE 205) have been re-scheduled as follows.

Date	Day	Courses
September 01, 2019	Sunday	EPEG 315, ETEG 303, GEOM 204, GEOM 319, CHEG 305, ENVE 205
September 05, 2019	Thursday	GEOM 206

Examination Time : 11.00 A.M. to 2.00 P.M.
Exam Centre : Kathmandu University, Dhulikhel.

Professor PANNA THAPA, PhD
Controller of Examinations

