Khulna University, Khulna

Urban and Rural Planning Discipline

2nd Year, Term-I Examination, Session 2024-2025

Course No. 0731 04 URP 2125

Full Title of Course: Introduction to Landscape and Urban Design

Full Marks: 60 **Time: 3 hours**

- The figures in the margin indicate full marks.
- Use separate sheet for each section.

Section A

There are **four** questions in this section. Answer any **three** questions.

1.	(a)	Differentiate between variety and robustness with example. [L1, CLO2]	04
	(b)	How variety of 'use' unlocks other level of Variety? [L2, CLO2]	06
2.	(a)	Define legibility in urban design. Name four physical elements that help people understand and navigate a place. [L1, CLO1]	04
	(b)	Explain why a clear hierarchy of streets and public spaces is important for wayfinding. [L3, CLO2]	06
3.	(a)	Mention two types of visual cues that can help users understand a place. [L1, CLO1]	04
	(b)	A new library is proposed in a historic town centre. Suggest how its façade, scale, materials and entrance design can make the building visually appropriate while still being recognisable as a public building. [L4, CLO3]	06
4.	(a)	Explain why richness should include both visual and non-visual qualities of urban space. [L2, CLO1]	04
	(b)	A public square feels visually plain, uncomfortable and inactive. Propose four sensory inputs to improve its richness of the square. [L4, CLO3]	06

Section B

There are **four** questions in this section. Answer any **three** questions.

1.	(a)	State the significance of cultural landscapes in landscape planning and design. [L2, CLO1]	03
	(b)	Explain why landscape design should be adapted to existing landforms. (L2, CLO1)	03
	(c)	Identify and explain four principles that can be applied to ecologically manage wetlands around Dhaka. [L2 CLO2]	04
2.	(a)	Outline the principles of line and form in designing a small garden space. Support your answer with labelled drawings and short explanatory notes. [L3, CLO3]	05
	(b)	Demonstrate how focalization and rhythm guide visual attention and pedestrian movement in a designed landscape. Support your answer with a labelled drawing. [L4, CLO3]	05
3.	(a)	Describe how plant form, size, texture, and colour together create plant architecture in landscape design. Support your answer with simple sketches where necessary. [L2, CLO2]	03
	(b)	Compare random spacing and geometric spacing of canopy trees in terms of landscape character and suitable use. [L2, CLO2]	03
	(c)	Propose the microclimatic principles needed for designing a residential neighbourhood in a warm-humid region such as Khulna. Add small sketches where needed. [L4, CLO2]	04
4.	(a)	Describe the role of a topographic survey and base map in helping planners understand site constraints and possibilities. [L2, CLO3]	04
	(b)	For a proposed neighbourhood park, prepare a simple site-selection matrix for two alternative sites using four criteria: access, drainage, surrounding land use, and open-space potential. [L3, CLO3]	06

Khulna University, Khulna

Urban and Rural Planning Discipline

2nd Year, Term-I Examination, Session 2024-2025

Course No. 0314 04 Soc 2175

Full Title of Course: Social Psychology

Full Marks: 60 **Time: 3 hours**

- The figures in the margin indicate full marks.
- Use separate sheet for each section.

Section A

There are **four** questions in this section. Answer any **three** questions.

1. (a) What is social psychology? Highlight the importance of studying social psychology in the context of urban and rural planning with relevant examples. [L2, CLO5] — 05
   (b) Describe the 'big ideas' of social psychology. How do these ideas help explain everyday social behavior? [L3, CLO2] — 05

2. (a) Define self-fulfilling prophecy and explain how it operates in social interactions. [L2, CLO1] — 05
   (b) Distinguish between automatic thinking and controlled thinking. Under what circumstances does a person switch from one to the other? [L3, CLO4] — 05

3. (a) What is group polarization? Explain how group discussions can lead members to adopt more extreme positions than they initially held. [L3, CLO4] — 05
   (b) Discuss the phenomenon of deindividuation. How does anonymity within a group affect individual behavior? [L4, CLO4] — 05

4. (a) 'Degraded surroundings can degrade behavior.' - Justify your answer with example. [L2, CLO1] — 05
   (b) What role does culture play in processes of social perception and attribution? [L3, CLO3] — 05

Section B

There are **four** questions in this section. Answer any **three** questions.

1. (a) What is social learning theory of aggression. How do media portrayals of violence influence aggressive behaviour in society? [L3, CLO5] — 05
   (b) Discuss the relationship between culture and aggression. How do cultural norms determine what is considered an acceptable expression of aggression in different societies? [L3, CLO3] — 05

2. (a) Illustrate the major motives that drive pro-social behaviour. How do these motives interact? [L2, CLO2] — 05
   (b) Explain the situational determinants of pro-social behaviour. What conditions make individuals more or less likely to help others, and how can communities be designed to encourage helping? [L4, CLO4] — 05

3. (a) Evaluate the role of frustration in triggering aggression. How can planners design urban environments that reduce frustration-induced aggression? [L3, CLO4] — 05
   (b) Illustrate the social psychology of materialism and its impact on sustainable living. [L3, CLO5] — 05

4. Write short notes on the following (any four): $2.5 \times 4 = 10$
   (a) Bystander Effect [L2, CLO2]
   (b) Stereotype threat [L2, CLO2]
   (c) Social facilitation [L2, CLO2]
   (d) Fundamental attribution error [L2, CLO2]
   (e) Self-fulfilling prophecy [L2, CLO2]

Khulna University, Khulna

Urban and Rural Planning Discipline

2nd Year, Term-I Examination, Session 2024-2025

Course No. 0542 04 Stat 2177

Full Title of Course: Statistical Methods for Planning Research

Full Marks: 60 **Time: 3 hours**

- The figures in the margin indicate full marks.
- Use separate sheet for each section.

Section A

There are **four** questions in this section. Answer any **three** questions.

1. (a) Differentiate between Parametric and Non-Parametric tests. Under what specific conditions must a planner choose a non-parametric test? [L2, CLO1] 03

   (b) State the Null and Alternative hypotheses for a study testing if a new suburb's water consumption is different from the city average. [L1, CLO2] 02

   (c) A regional planning authority states that the average daily water consumption per household is 150 liters with a standard deviation of 20 liters. A planner samples 100 households and finds a mean consumption of 155 liters. Conduct the appropriate test at a 5% significance level. Find the critical value from your distribution table to conclude your result. [L3, CLO2] 05

2. (a) A planner wants to compare the "Average Noise Levels" (in decibels) between two different residential zones (Zone A and Zone B). Should the planner use an Independent Samples T-test or a Paired Samples T-test? Justify your choice. [L2, CLO1] 03

   (b) A local municipality installs a new "Low-Noise Pavement" and measures the noise reduction at 16 different locations. The sample mean noise reduction was found to be 2.5 dB with a sample standard deviation of 4 dB. 05

   i) Perform the appropriate statistical test to determine if the pavement significantly changes noise levels at a 5% significance level (two-tailed).

   ii) Show your calculation for the test statistic.

   iii) Using your distribution tables, find the correct critical value for $df=15$ and state your final conclusion regarding the pavement's effectiveness. [L4, CLO2]

   (c) If the result in (b) is statistically significant, why might a planner still want to calculate the Effect Size before recommending a city-wide rollout of the pavement? [L2, CLO1] 02

3. (a) A study on residential satisfaction in Nirala residential area yields a dataset with 15 variables. After running Factor Analysis, the eigenvalues of the extracted components (in descending order) are: 04

   4.8, 2.1, 1.4, 0.98, 0.76, 0.65, 0.54, 0.53, 0.50, 0.47, 0.44, 0.40, 0.37, 0.33, and 0.30.

   Using the *Latent Root Criterion* and the *Scree Test Criterion*, how many factors should be retained? Discuss any limitations of applying these criteria when the number of variables is fewer than 20, as is the case in this study.

   (b) A team studying air pollution determinants across 10 wards of Khulna City collects data on brick kiln proximity, vehicle density, industrial zone distance, green cover percentage, road dust index, and rainfall frequency. Before applying Factor Analysis, they run diagnostic tests and find: 02

   KMO value = 0.46

   Bartlett's test significance = 0.08

   Based on the assumptions of Factor Analysis, what do these results indicate? Should the team proceed with the analysis? What corrective actions, if any, would you recommend?

(c) Distinguish between data summarization and data reduction as objectives of Factor Analysis. 02

(d) A researcher studying urban heat island intensity across wards of Khulna finds the following factor loadings after extraction: 02

Variable	Factor 1	Factor 2
Impervious surface %	0.81	0.12
Green cover %	−0.74	0.09
Building height avg.	0.68	0.21
Proximity to water body	−0.29	0.71
Socioeconomic vulnerability index	0.18	0.65
Distance from open space	0.32	0.58

Interpret what each factor likely represents in the context of Khulna's urban environment. Identify any cross-loading variable and explain its implications for the factor solution.

4. (a) A regression model predicts "Housing Density (units/acre) (Y)" based on "Distance from the City Center (X)." The equation is: $Y = 40 - 2.5X. Interpret the intercept and the slope. [L2, CLO1] 03

(b) Predict the housing density for a neighborhood located 6 km from the city center. [L3, CLO2] 02

(c) A planner models "Property Value" based on "Walkability Score." For a sample of 22 properties, the Sum of Squares Model (SS_M) is 450 and the Total Sum of Squares (SS_T) is 750. Calculate the appropriate statistic to determine the significance of the model (df_M=1, df_R=20) and interpret the R^2 value. [L3, CLO2] 05

Section B

There are **four** questions in this section. Answer any **three** questions.

1. (a) State the primary assumptions required to perform a One-Way ANOVA. [L1, CLO1] 03

(b) A regional planner is comparing the average construction cost (in Million BDT) for three types of structural frames. The following data was collected from 1 project sites: 05

Concrete	Steel	Timber
10	14	9
12	12	8
11	16	10
11	14	9

Calculate the appropriate statistic to determine if there is a significant difference in costs among the three materials at a 5% significance level. [L4, CLO2]

(c) Using your distribution tables, find the critical value for (b) and state your final conclusion regarding whether material choice significantly impacts project costs. [L4, CLO2] 02

2. (a) In urban research, why is MANOVA preferred over running multiple separate ANOVAs when the dependent variables (DVs) are correlated? [L2, CLO1] 03

(b) A planner evaluates two Urban Designs: Gridiron Layout and Cul-de-sac Layout. He measures two dependent variables: Pedestrian Volume (Y_1) and Retail Revenue (Y_2). The following data is collected: 05

Design Layout	Pedestrian Volume (Y1)	Retail Revenue (Y2 in 000)
Gridiron	150, 160, 140	40, 42, 38
Cul-de-sac	80, 90, 70	20, 25, 15

Calculate the Mean Vectors for both designs and determine the Difference Vector (d). Based on these results, explain how a multivariate test determines if the layout design significantly affects both pedestrian activity and economic output simultaneously. [L3, CLO2]

(c) If the multivariate test for (b) results in a p-value of 0.001, what is the planner's conclusion at a 5% significance level? Should they proceed to examine the individual effects on Volume and Revenue separately? [L4, CLO2] 02

3. (a) A transportation survey examines whether travel mode (walking, rickshaw, bus, motorcycle) is independent of residential zone type (planned, unplanned, peri-urban) in Khulna Metropolitan Area. A 4 × 3 contingency table yields a Pearson Chi-Square statistic of $\chi^2 = 22.81$. [CLO3, L3] 04

(i) State clearly the null and alternative hypotheses for this test.

(ii) Calculate the degrees of freedom.

(iii) At the 0.05 significance level, the critical value of χ^2 for these degrees of freedom is 12.59. What conclusion do you draw? State your decision rule precisely.

(iv) Explain why a large sample (n = 1,200 in this case) may lead to rejection of the null hypothesis even when the actual association between variables is very weak.

(b) Using previous For the Khulna travel-mode study above, the researcher computes Cramer's V = 0.09 ($p < 0.05$). Interpret the result. What follow-up analysis would you recommend to understand which specific mode–zone combinations drive the association, and why? [CLO2, L4] 02

(c) A planning researcher in Khulna City Corporation (KCC) collects survey data on 450 households in three wards — Khalishpur, Sonadanga, and Daulatpur — and records (i) housing tenure type (owner-occupied, renter-occupied, squatter) and (ii) the household's primary solid waste disposal method (municipal dustbin, roadside dumping, open burning, canal/waterbody). State the conditions under which the Chi-Square test of independence is the appropriate statistical test for this data. Identify at least four assumptions that must be satisfied, and for each, assess whether this dataset is likely to satisfy it. Justify your reasoning. [CLO3, L2] 04

4. A planner predicts if a commuter will choose Cycling (Y=1) over Driving (Y=0). The model is: $Logit(P) = -3.5 + 0.2 \times (\text{Bike Lane Density}) + 0.4 \times (\text{Fuel Price})$.

(a) For a district with Bike Lane Density = 10 and Fuel Price = 5, calculate the Logit (z). [L3, CLO2] 02

(b) Calculate the Probability (P) of choosing cycling. Show your calculation steps. [L3, CLO2] 05

(c) Calculate the Odds Ratio ($Exp(B)$) for "Fuel Price" (B=0.4) and interpret the result for urban transport policy. [L3, CLO2] 03

Khulna University, Khulna

Urban and Rural Planning Discipline

2nd Year, Term-I Examination, Session 2024-2025

Course No. URP 2151

Full Title of Course: Statistical Methods for Planning Research

Full Marks: 60 **Time: 3 hours**

- The figures in the margin indicate full marks.
- Use separate sheet for each section.

Section A

There are **four** questions in this section. Answer any **three** questions.

1. (a) Define null and alternative hypotheses, and give an example of each. 02
   (b) What are type I and type II errors? How are they related? 03
   (c) Briefly discuss the implication of hypothesis testing in planning research. 05

2. (a) A single card is drawn at random from an ordinary deck of cards. Find the probability that it is either an ace or a black card. 02
   (b) Three cards are drawn from an ordinary deck and not replaced. Find the probability of these events: 04
      i. Getting 3 jacks
      ii. Getting an ace, a king, and a queen in order
      iii. Getting a club, a spade, and a heart in order
      iv. Getting 3 clubs
   (c) Box 1 contains 2 red balls and 1 blue ball. Box 2 contains 3 blue balls and 1 red ball. A coin is tossed. If it falls heads up, box 1 is selected and a ball is drawn. If it falls tails up, box 2 is selected and a ball is drawn. Find the probability of selecting a red ball. 04

3. (a) Why do researchers use Time Series Data Analysis? 02
   (b) Khulna city experiences seasonal variation in household water demand throughout the year. To examine this pattern, quarterly water consumption data were recorded for the last three years. 08

Year	Quarter	Water Consumption (million litres)
2023	Jan–March	19.2
	April–June	24.1
	July–Sept	21.0
	Oct–Dec	18.0
2024	Jan–March	20.0
	April–June	25.3
	July–Sept	22.4
	Oct–Dec	18.8
2025	Jan–March	21.1
	April–June	26.5
	July–Sept	23.2
	Oct–Dec	19.6

Calculate the seasonal index for each quarter and present the data in tabular form excluding the effect of seasonality.

4. (a) Why is ANOVA used in statistical analysis? 02
   (b) Differentiate between One-Way ANOVA and Two-Way ANOVA. 03
   (c) The following data show the marks of students from three disciplines of Khulna University in a Statistics course: 05

Student No.	URP	Economics	Environmental Science
1	72	65	75
2	68	70	80
3	75	74	78
4	80	69	82

Using One-Way ANOVA, test whether there is any significant difference among the mean marks of the three disciplines at 5% level of significance.

Section B

There are **four** questions in this section. Answer any **three** questions.

1. (a) Describe Bayes' Theorem using appropriate graphics. 03
   (b) Relate Experimental Probability with Theoretical Probability. 03
   (c) A survey was conducted among 300 daily commuters in Khulna city to examine the use of different travel modes for accessing the Central Business District (CBD). The survey findings show that: 120 commuters use bus services, 90 commuters use rickshaws, and 80 commuters use motorcycles for their daily travel. However, 25 commuters use both bus and rickshaw, 20 commuters use both bus and motorcycle, 15 commuters use both rickshaw and motorcycle, and 5 commuters use all three modes of transport. Determine the probability that a randomly selected commuter uses at least one of the three travel modes. 04

2. (a) What are the types of correlation? 02
   (b) Differentiate between positive and negative correlation. 03
   (c) "Correlation does not imply causation" – do you think so? Defend your position. 05

3. Urban Development Directorate (UDD) and Department of Environment (DoE) want to examine the relationship among solid waste generation, household income, and population density in selected cities of Bangladesh.

   Urban Environmental Management Data -

City	Solid Waste Generated (tons/day)	Average Household Income (BDT/month)	Population Density (persons/hectare)
Khulna	520	42000	380
Rajshahi	430	36000	340
Barisal	350	31000	300
Gazipur	240	25000	250
Chattogram	180	22000	210

   (a) Identify the dependent and independent variables. 01
   (b) Using an appropriate statistical method, analyze the relationship among the variables and interpret the findings. 03
   (c) Calculate the Multiple Coefficient of Correlation. Explain how the result can be used to measure the strength of the relationship among the variables. 06

4. (a) What do you mean Eigenvalue and loading vector in Principal Component Analysis (PCA)? 03
   (b) Differentiate between PCA and Factor Analysis. 02
   (c) What are the principal components of PCA? Explain with example. 03
   (d) What is a biplot in PCA? 02

Khulna University, Khulna

Urban and Rural Planning Discipline

2nd Year, Term-I Examination, Session 2024-2025

Course No. 031404 Soc 2179

Full Title of Course: Population and Gender Studies

Full Marks: 60 **Time: 3 hours**

- The figures in the margin indicate full marks.
- Use separate sheet for each section.

Section A

There are four questions in this section. Answer any three questions.

1. (a) What is vital statistics? Identify and write the type of statistics covered by the Bangladesh Sample Vital Statistics. [L2, CLO2] 03

   (b) In 2025, the mid-year population of Khulna City was 1,000,000. During that year, a total of 8,500 deaths occurred, of which 100 were due to road accidents. As a planner for Khulna City Corporation (KCC), calculate the cause-specific death rate (per 1,000 population) due to road accidents. [L3, CLO3] 03

   (c) Why does the Bangladesh Bureau of Statistics (BBS) use the exponential growth model for population projection in the Population and Housing Census 2022? Explain the rationale and write the exponential growth equation with all parameters clearly defined. [L4, CLO3] 04

2. (a) Draw the five stages of the Demographic Transition Model (DTM), highlighting the key characteristics of each stage. [L1, CLO2] 03

   (b) What is meant by replacement level of fertility? If a couple needs two children to replace themselves, why is the Total Fertility Rate (TFR) often taken as 2.1 instead of 2.0 in many developing countries? [L2, CLO2] 03

   (c) Critically evaluate the Marxian perspective on population, highlighting its major limitations and criticisms. [L5, CLO5] 04

3. (a) Explain the fundamental principles of the Bangladesh Population Policy 2025. [L2. CLO1] 04

   (b) Using the data provided below for 2025, calculate the following fertility indicators: [L3, CLO6] 2×3 = 06

   i) Crude Birth Rate (CBR)
   ii) General Fertility Rate (GFR)
   iii) Age-Specific Fertility Rate for the 20–24 age group ($ASFR_{20\text{-}24}$)

Cohort	Live Births (2025)	Female Population (2025)	Male Population (2025)
(15–19)	11,000	179,000	180,000
(20–24)	20,000	192,000	190,000
(25–29)	22,000	222,000	220,000
(30–34)	20,000	213,000	215,000
(35–39)	10,000	212,000	214,000
(40–44)	2,000	210,000	203,000
(45–49)	500	200,000	200,000

4. Write short note on any four of the following: [L2, CLO2] $2.5 \times 4 = 10$

   (a) Fertility vs. Fecundity
   (b) De-facto vs. De-jure
   (c) Neo-Malthusian
   (d) Child-Woman Ratio
   (e) Migration Stock vs Migration Flow

Section B

There are four questions in this section. Answer any three questions.

1.	(a)	"Gender is a socially constructed issue for both men and women." Discuss this statement with examples. [L2, CLO2]	02
	(b)	Explain the roles of women established from feminist debate. [L2, CLO2]	03
	(c)	How would you apply the "5R framework of Care work" to address unequal care responsibilities? Answer with examples. [L3, CLO5]	05
2.	(a)	What is the primary goal of feminism? Discuss the principles of feminism developed by Oxfam. [L2, CLO2]	04
	(b)	Compare and contrast Liberal, Radical, and Socialist feminism regarding the perspectives on addressing the 'root cause' of gender inequality and achieving societal change. [L5, CLO5]	06
3.	(a)	Differentiate between the efficiency and empowerment approaches of women in development. [L2, CLO5]	04
	(b)	Suppose you are a gender specialist. How would you apply RCA (Rapid Care Analysis) tool, and for what purposes would you use it? [L3, CLO5]	06
4.	(a)	Analyse the association between women's triple role and Gender Based Violence (GBV). [L4, CLO5]	05
	(b)	What are different forms of GBV? Propose some guidelines and planning strategies for addressing various forms of GBV. [L3, CLO5]	05

Khulna University, Khulna

Urban and Rural Planning Discipline

2nd Year, Term-I Examination, Session 2024-2025

Course No. 073104 URP 2111

Full Title of Course: Rural Planning I

Full Marks: 60 **Time: 3 hours**

- The figures in the margin indicate full marks.
- Use separate sheet for each section.

Section A

There are **four** questions in this section. Answer any **three** questions.

1. (a) What do you mean by social construction of Rurality? [L2, CLO1] 03
   (b) Measure the rurality index using the following information in the table and explain the results. [L4, CLO 1] 07

Area	Population Density (persons/km²)	Internet Users (%)	Health Centers per 10,000 People	Literacy Rate (%)	Agricultural Employment (%)
A	95	28	1.2	62	78
B	140	45	2.5	70	65
C	75	20	0.8	58	82
D	180	60	3.1	76	54
E	110	35	1.7	66	71

2. (a) Assess the effectiveness of past regional planning approaches for the development of rural areas. [L5, CLO2] 05
   (b) How would you apply the sustainable livelihood framework for rural development in Bangladesh? [L3, CLO1] 05

3. (a) What are the implications of urban rural linkage in Rural Planning? [L2, CLO2] 03
   (b) Compare the small farm approach and livelihood approach. [L5, CLO2] 04
   (c) Discuss the shift from dual-economy theory to the small-farm approach in rural development. [L2, CLO1] 03

4. (a) Why are poverty issues in Bangladesh still not addressed, despite the increase in GDP? [L2, CLO2] 04
   (b) Evaluate the modernization, dependency, redistribution and basic need approaches in addressing poverty, equity and development in the context of Rural Bangladesh. [L5, CLO1] 06

Section B

There are **four** questions in this section. Answer any **three** questions.

1. (a) Analyze the beginning and continuation of rural development planning in Bangladesh. [L4, CLO3] 05
   (b) Evaluate the Cumilla Model from the viewpoint of important critical issues of rural Bangladesh. [L5, CLO3] 05

2. (a) Categorize the NGOs in rural Bangladesh with appropriate examples. [L4, CLO3] 04
   (b) "Government and NGOs collaboration is a must for rural development in Bangladesh." Do you agree or not? Defend your answer with appropriate examples. [L5, CLO3] 06

3. (a) Identify the sector-wise challenges for the rural development of *Shoilmari* village in Khulna district. [L3, CLO4] 05
   (b) Propose a roadmap for the comprehensive development of *Shoilmari* village in Khulna district. [L6, CLO4] 05

4. (a) Analyze how the efforts of infrastructural development in Tennessee Valley against the great depression has expedited rural development planning in the USA. [L4, CLO4]
   (b) Examine the rural development programmes of China to reduce the regional imbalances. [L4, CLO4]