



PAN AFRICAN CHRISTIAN UNIVERSITY

UNIVERSITY EXAMINATIONS 2024/2025

**THIRD TRIMESTER EXAMINATION FOR THE DIPLOMA IN CRIMINOLOGY AND
SECURITY MANAGEMENT**

DCR 118: CRIME MAPPING AND SECURITY MANAGEMENT

Instructions:

There are **THREE QUESTIONS**. Answer any **TWO QUESTIONS**.

Each question is 20 marks. Support your answers with relevant examples.

QUESTION ONE

- a) With five (5) relevant examples, discuss how banks have been victims of cyber-crime due to weak information security. (10 Marks)
- b) As an Officer Commanding Police Division, critically outline how you would carry out crime mapping in your division. (10 Marks)

QUESTION TWO

- a) Crime Mapping is a game changer in modern policing that has many merits. Briefly expound any five (5) merits. (10 Marks)
- b) Sayari is a sub-county in Kenya that is composed of two wards. One of the wards (Zayuni) has a crime rate of 5 per 1,000 while the other ward (Kona Mbaya) has a crime rate of 69 per 1,000.
 - i. Outline five (5) reasons why Kona Mbaya has more crime than Zayuni (5 Marks)
 - ii. Describe any Five (5) measures that should be put into place to reduce the high rate of crime in Kona Mbaya? (5 Marks)

QUESTION THREE

- a) Assume that you are an intelligence officer working at the National Intelligence Service. Using five (5) relevant examples, elucidate on how you will use intelligence reports to locate Hot Spots. (10 Marks)
- b) Using any five (5) relevant examples, describe how Routine Activity Theory can be used to explain property crime in urban areas. (10 Marks)

DCR 118: CRIME MAPPING AND SECURITY MANAGEMENT

Marking Scheme

QUESTION ONE

- a) With five (5) relevant examples, discuss how banks have been victims of cyber-crime due to weak information security. (10 Marks)

Common Weaknesses Leading to Breaches

- *Outdated Software – Many banks still run legacy systems vulnerable to zero-day exploits.*
- *Phishing & Social Engineering – Employees fall for scams due to weak cybersecurity training.*
- *Third-Party Vulnerabilities – Attacks like SolarWinds (2020) show supply chain risks.*
- *Insufficient Encryption – Some banks still use weak SSL/TLS protocols, making data interception easier.*
- *Insider Threats – Some breaches occur due to malicious employees, not just weak systems.*
- *Advanced Persistent Threats (APTs) – State-sponsored hackers (e.g., North Korea's Lazarus Group) can bypass even strong defenses.*
- *Some Banks Have Strong Security but Still Get Hacked*
- *Most major bank cybercrimes do stem from preventable weaknesses (poor patching, training, third-party risks).*
- *Some attacks succeed despite strong security due to advanced threats or insider risks.*

(Any one point (1 mark) and a relevant example (1marks)=10marks)

- b) **As an Officer Commanding Police Division, critically outline how you would carry out crime mapping in your division.**

Leverage Multiple Data Sources

Police Records:

- *Extract crime reports (theft, assault, burglary) from the Occurrence Book (OB).*
- *Include time, location, modus operandi (MO), and suspect descriptions.*

Patrol & Surveillance Logs: GPS-tracked patrol routes and CCTV footage.

Community Reports: Anonymous tip lines (SMS, apps).

External Agencies:

- *Hospital records (for unreported assaults).*
- *Traffic police data (linked to carjackings).*

Crime Data Analysis

- *Hotspot Mapping: Use Kernel Density Estimation (KDE) to find high-crime zones.*
- *Time-Heat Mapping: Pinpoint peak crime hours (e.g., 10 PM–2 AM for burglaries)*
- *Flag locations hit multiple times (e.g., a robbed shop 3x in a month).*
- *Overlay with: Poverty rates, Streetlight coverage, Liquor license density.*

Deployment & Intervention Strategies

Targeted Policing

- *Hotspot Patrols: Deploy foot patrols to high-risk zones*
- *Directed Patrols: Use predictive policing algorithms to anticipate crimes.*

Community Engagement

- *Neighborhood Watch Programs: Train locals in crime reporting apps*
- *Public Crime Maps: Share sanitized hotspot maps to build trust*

Infrastructure & Policy Adjustments

- *Environmental Design (CPTED): Improve street lighting in hotspot alleys.*
- *Demolish abandoned buildings used for drug deals.*
 - *Policy Shifts: Advocate for stricter liquor laws in high-assault areas.*

(Any one point (1 mark)=10marks)

QUESTION TWO

- a) Crime Mapping is a game changer in modern policing that has many merits. Briefly expound any five (5) merits. (10 Marks)

Crime mapping is the visual representation of crime data using Geographic Information Systems (GIS). It has revolutionized law enforcement strategies worldwide.

1. Proactive Crime Prevention

Transforms policing from reactive to proactive.

- *Identifies crime hotspots (e.g., burglary clusters in a neighbourhood).*
- *Predicts future crime trends using historical data (e.g., seasonal theft spikes).*

2. Efficient Resource Allocation

- *Maximizes limited police resources.*
- *Directs patrols, surveillance, and community programs to high-crime zones.*
- *Avoids over-policing low-risk areas.*

3. Enhanced Investigative Support

Helps solve crimes faster.

- *Links crimes geographically to identify serial offenders (e.g., a burglar targeting specific streets).*
- *Overlays data like CCTV locations or escape routes for suspect tracking.*

4. Improved Community Engagement

Builds public trust through transparency.

- *Shares crime maps with residents via public dashboards (e.g., SpotCrime.com).*
- *Encourages neighbourhood watch programs in high-risk areas.*

5. Data-Driven Policy Making

Supports evidence-based law enforcement strategies.

- *Tracks long-term crime trends (e.g., drug markets shifting locations).*
- *Evaluates policy effectiveness (e.g., Did increased patrols reduce thefts?).*

6. Cross-Agency Collaboration

Facilitates multi-agency crime-fighting.

- *Integrates data from police, social services, and schools to address root causes (e.g., youth crime linked to truancy).*

7. Crime Pattern Recognition

Uncovers hidden trends.

- *Detects modus operandi (MO) patterns (e.g., burglars always strike between 2-4 PM).*
- *Flags emerging threats (e.g., a rise in cybercrime in a specific district).*

8. Cost-Effective Policing

Reduces wasted budgets.

- *Avoids blanket patrols → saves manpower and fuel costs.*
- *Prioritizes preventive measures over costly post-crime investigations.*

(Any five points (2 marks)=10marks)

b) Sayari is a sub-county in Kenya that is composed of two wards. One of the wards (Zayuni) has a crime rate of 5 per 1,000 while the other ward (Kona Mbaya) has a crime rate of 69 per 1,000.

i. Outline five (5) reasons why Kona Mbaya has more crime than Zayuni (5 Marks)

Sayari Sub-County has two wards with vastly different crime rates:

- *Zayuni Ward: 5 crimes per 1,000 people (Low crime)*
- *Kona Mbaya Ward: 69 crimes per 1,000 people (High crime)*

These 13.8 times disparities, suggests structural differences in:

- *Socioeconomic conditions*
- *Policing strategies*
- *Community trust in law enforcement*
- *Availability of crime opportunities*

Root Causes of High Crime in Kona Mbaya

a) Socioeconomic Factors

- *Unemployment & Poverty; Higher incentive for theft, fraud, and gang recruitment.*
- *Poor Infrastructure; Poor lighting, abandoned buildings = more crime hotspots.*
- *Drug & Alcohol Abuse; Linked to violent crimes and petty theft.*

b) Policing & Security Gaps

- *Low Police Visibility; Fewer patrols, slower response times.*

- **Corruption & Mistrust:** Residents avoid reporting crimes.
- **Lack of Crime Intelligence:** Reactive (not proactive) policing.

c) Weak Community Engagement

- **No Neighborhood Watch:** Less informal surveillance.
- **Cultural Norms:** Vigilantism or silence due to fear of reprisals.

(Any five points (1 mark)=5 marks)

ii. Describe any Five (5) measures that should be put into place to reduce the high rate of crime in Kona Mbaya? (5 Marks)

Strategic Interventions to Reduce Crime Disparity

A. Immediate (Short-Term) Measures

Hotspot Policing

- Deploy more patrols in Kona Mbaya's high-crime zones (e.g., markets, bars).
- Use crime mapping to identify robbery/theft clusters.

Rapid Response Unit

- 24/7 police patrols near robbery-prone areas.
- Community hotline for anonymous tips.

Visible Crackdowns on Key Crimes

- Target drug dens & illegal arms (most violent crimes stem from these).
- Arrest repeat offenders to disrupt criminal networks.

B. Medium-Term (6-12 Months) Strategies

Community Policing & Trust-Building

- Town hall meetings to improve police-community relations.
- Recruit local informants to gather intelligence.

Youth & Economic Programs

- *Vocational training for unemployed youth (reduces gang recruitment).*
- *Microfinance support for small businesses (reduces theft incentives).*

Infrastructure Improvements

- *Install streetlights in dark alleys.*
- *Demolish abandoned buildings used for criminal activities.*

C. Long-Term (1-3 Years) Solutions

Intelligence-Led Policing

- *Crime data analysis to predict trends (e.g., seasonal burglaries).*
- *Undercover operations against organized crime.*

Policy & Legal Reforms

- *Stricter penalties for repeat offenders.*
- *Police accountability to reduce corruption.*

Replicate Zayuni's Success

- *Study Zayuni's strategies (e.g., community watch, youth centers).*
- *Apply best practices to Kona Mbaya.*

(Any one point (1 mark)=5 marks)

QUESTION THREE

a) Assume that you are an intelligence officer working at the National Intelligence Service.

Elucidate on how you will use intelligence reports to locate Hot Spots. (10 Marks)

As an Intelligence Officer at the National Intelligence Service (NIS), identifying crime hotspots requires a multi-layered analytical process combining data mining, field intelligence, and predictive modeling.

PRIMARY INTELLIGENCE SOURCES

Objective: Gather and standardize intelligence from diverse sources.

- *Police Crime Databases*
 - *Extract Occurrence Book (OB) entries, arrest records, and case files.*
- *Human Intelligence (HUMINT)*
 - *Undercover agents, informants, and community tip-offs.*
- *Open-Source Intelligence (OSINT)*
 - *Social media chatter (e.g., gang activity on Facebook/WhatsApp).*
 - *News reports on crime trends.*
- *Electronic Intelligence (ELINT)*
 - *CCTV footage, ANPR (Automatic Number Plate Recognition) data.*
- *Financial Intelligence (FININT)*
 - *Suspicious transactions linked to organized crime.*

Data Normalization

- *Geotagging: Assign GPS coordinates to each crime report.*
- *Time-Stamping: Log exact times of incidents for temporal analysis.*

SPATIAL & TEMPORAL CRIME ANALYSIS

Objective: Identify geographical and time-based patterns.

Hotspot Mapping (Geospatial Analysis)

- *Kernel Density Estimation (KDE):*
 - *Visualizes crime clusters (e.g., armed robberies in Nairobi's Eastleigh).*
- *Risk Terrain Modeling (RTM):*
 - *Overlays crime data with environmental factors (e.g., poor lighting, bars, unguarded ATMs).*

Temporal Trends

- *Peak Crime Hours:*
 - *Example: Carjackings spike between 7 PM – 11 PM.*
- *Seasonal Variations:*
 - *Example: Burglaries increase during festive seasons.*

NETWORK & LINK ANALYSIS

Objective: *Uncover organized crime networks operating in hotspots.*

Social Network Analysis (SNA)

- *Identify Key Players:*
 - *Who are the most connected suspects?*
- *Map Gang Hierarchies:*
 - *Example: Local gang links to street-level crimes e.g Gaza.*

Modus Operandi (MO) Matching

- *Signature Crimes:*
 - *Example: A serial robber always uses a blue getaway bike.*

PREDICTIVE INTELLIGENCE & PROACTIVE DEPLOYMENT

Objective: *Anticipate future hotspots.*

Machine Learning Models

- *Predictive Policing Algorithms (e.g., PredPol):*
 - *Forecasts where crimes are most likely to occur next.*
- *Sentiment Analysis:*
 - *Monitors social media for planned protests or gang violence.*

Real-Time Crime Centers

- *Live Dashboards:*
 - *Integrate CCTV, patrol GPS, and emergency calls for instant hotspot detection.*

Example: Dubai's Smart Police Stations use AI to predict crimes.

VALIDATION & FIELD OPERATIONS

Objective: *Verify intelligence before deployment.*

Undercover Operations

- *Deploy plainclothes officers to suspected hotspots.*
- *Use bait operations (e.g., unmarked cars in carjacking zones).*

Community Feedback

- *Cross-check with local leaders and businesses.*

DISSEMINATION & ACTIONABLE STRATEGIES

Objective: *Turn intelligence into police action.*

Tactical Reports for Police Units

- *Format:*
 - *Hotspot Map + List of High-Risk Targets.*
 - *Recommended Patrol Routes.*

Policy Recommendations

- *Infrastructure Fixes:*
 - *Install streetlights in dark alleys.*
- *Legal Measures:*
 - *Push for stricter bail laws for repeat offenders.*

(Any one point (1 mark)=10marks)