

# 08 WEEKS NAVIGATIONAL SKILL COURSE

## AIM

To prepare a pool of navigators for field units and instructors for training institutions proficient in field navigational skill with latest navigational trends, in order to enhance the operational capabilities of the troops.

## OBJECTIVE

At the end of training, trainees will be able to effectively perform the duties of navigational skill instructors and navigators with following capability:-

01. **Analyze** the terrain by using survey of India map and **plan** the operation with the help of SOI map.
02. **Navigate** by using compass and SOI map.
03. **Navigate** by using GPS.
04. **Analyze** the terrain by using GIS and **plan** the operation on GIS software.
05. **Navigate** with the help of various mobile navigational apps like maverick, oruxmaps etc
06. **Integrate** GPS with GIS.
07. **Prepare** sand model, eye sketch, field sketch and enlargement for briefing purpose.

# DESIGN BRIEF

Name of course	:	Navigational skill course
Duration	:	<b>8 weeks</b>
Aim	:	To train the participants in navigational skills to enhance the operational efficiency of the force.
Master trainer	:	Proficient and Qualified instructor in navigational skill.
<b>Trainee</b>	:	<b>Constable to Assistant commandant.</b>
<b>No of trainees</b>	:	<b>Not more than 40.</b>
Entry behavior of trainees	:	<ul style="list-style-type: none"> <li>a). Preferably science or geography background.</li> <li>b). Minimum Educational qualification -10+2.</li> <li>c). Willing.</li> <li>d). Having basic computer knowledge.</li> <li>e). Preference should be given to graduate &amp; above.</li> <li>f) Trainee must be below 40 years.</li> </ul>
Location	:	Computer lab with internet facility must be available and hilly/ jungle terrain for practical exposure.
Trg aid & Adm requirement	:	<ul style="list-style-type: none"> <li>a). Indoor class room facilities with projector, visualizer, chair etc.</li> <li>b) Computer lab with internet facility.</li> <li>c) Sufficient quantity of GPS ,compass ,service protector and smart phone.</li> <li>d) SOI map of area and satellite images of area.</li> <li>e) Accommodation for trainees.</li> </ul>
Assessment	:	Knowledge & skill test, Instructional ability test - As per test policy.

## **BLOCK TIME TABLE**

### **NAVIGATIONAL SKILL COURSE SYLLABUS**

		<b>Revised</b>
1.	<b>Duration</b>	<b>08 Weeks</b>
2.	No. of working days in a week	06 Days
3.	<b>Total working days</b>	<b>48 Days</b>
4.	<b>Working periods in a day</b>	<b>10 Periods</b>
5.	Duration of period	40 Minutes
6.	<b>Total working period (48x10)</b>	<b>480 Periods</b>
7.	Night exercise	42 Periods
8.	<b>Total working periods during course</b>	<b>522 Periods</b>

**Note** :- Concerned training institute will ensure to provide one GPS per buddy and one tracker to each team.

## **BLOCK SYLLABUS**

S/No	Code	SUBJECT	NO. OF PERIOD ALLOTTED(Revised)		
			Day	Night	Total
1.	CPT	Condensed Physical Training	46	--	46
2.	MR	TOPOGRAPHICAL MAP READING	86	02	88
3.	CN	COMPASS NAVIGATION	40	08	48
4.	GPS	GPS NAVIGATION	22	10	32
5.	GIS	GIS	126	14	140
6.	MAN	MOBILE APPS NAVIGATION	42	08	50
7.	MISC	MISC SUBJECT	44	--	44
8.	OCF	OPENING, CLOSING &FINAL TEST	34	--	34
9.	G		40	--	40
		Total	480	42	522

## DETAILED SYLLABUS

### 1. Topographical map reading module:

**106 PDS**

**Objective:-** At the end of training, trainees will be able to **Analyze** the terrain by using survey of India map and **plan** the operation with the help of SOI map.

SI No.	CODE	SUBJECT	DAY		NIGHT	TOTAL
			LEC	Guided Practice		
	<b>MR</b>	<b>MAP READING</b>				
1	MR 1	Introduction to Topo map & safety precaution with handling of Map	01	-	-	01
2	MR 2-4	Coordinate System, Latitude, longitude, altitude etc,	03	-	-	03
3	MR 5-6	Map and its outer Information.	02	-	-	02
4	MR 7-10	Conventional sign (Survey sign only)	02	02	-	04
5	MR 11-16	Scale-and its kinds and Showing Scale.	02	04	-	06
6	MR 17-20	Measuring Ground distance on the map.	02	02	-	04
7	MR 21-23	Direction and its degrees.	02	01	-	03
8	MR 24-28	Finding North and kinds of North.	02	03	-	05
9	MR 29-32	Finding North from Moon and Stars.	01	-	03	04
10	MR 33-37	Setting of Map with the help of map features, Topo forms and sun/moon.	01	02	02	05
11	MR 38-47	Relief, its representation & Contour study	02	08	-	10
12	MR 48-51	Topographical Forms.	02	02	-	04
13	MR 52-57	Map Grid Reference	02	04	-	06
14	MR 58-65	Map Geo reference	02	06	-	08
15	MR 66-68	Gradient and tangent.	01	02	-	03
16	MR 69-72	Inter visibility.	02	02	-	04
17	MR 73-76	Asian Series	02	02		04
18	MR 77-80	Grid index System	02	02		04
19	MR 81-84	International series and index of Map Sheet.	02	02	-	04
20	MR 85-88	Map Marking and Taping.	02	02	-	04
21	MR 89-96	Topo Map revision	02	04	02	08
22	MR 97-104	Skill test of topo map	-	08	-	08
23	MR105-106	Snap test	02	-	-	02
		<b>TOTAL</b>	<b>41</b>	<b>58</b>	<b>07</b>	<b>106</b>

## 2. Compass Navigation Module

56 PDS

**Objective:-** At the end of training, trainees will be able to **navigate** by using compass and SOI map

Sl.No.	Code	Subject	DAY		Night	Total
			LEC	Guided Practice		
1.	MR-1-4	Compass, kinds and its use	02	02	-	04
2.	MR 5-8	Bearing	02	02	-	04
3.	MR -9-12	M.V, AOC , LV, LMA , ICF , ICE, Bearing , Conversion of Bearing.	02	02	-	04
4.	MR 13-15	Service protector and kinds of service protector.	01	02	-	03
5.	MR 16-21	Setting of Map and finding own Position.	02	04	-	06
6.	MR 22-27	Map to ground and ground to map.	02	04	-	06
7.	MR 28-30	Day/Night march chart	01	01	01	03
8.	MR -31-44	Day/Night Navigation.	02	04	08	14
9	MR 45-56	Orienteering. (Treasure hunt, Route Recce score orienteering. Line orienteering, Point to Point orienteering, and relay event, crosses country and night exercise.)	02	06	04	12
<b>TOTAL</b>			<b>16</b>	<b>27</b>	<b>13</b>	<b>56</b>

## 3. GPS NAVIGATION MODULE

36 PDS

**Objective:-** At the end of training, trainees will be able to navigate by using GPS

Sl.No	Code	Subject	DAY		Night	Total
			LEC	Guided Practice		
1	GPS 1-2	Introduction to Global Positioning System.	02	-	--	02
2	GPS 3	ON - OFF switch, menu function of GPS	01	-	-	01
3	GPS 4-6	Setting and Calibration of GPS.	-	03	--	03
4	GPS 7-10	Finding own position and Feeding waypoints in grid and geo reference,	-	02	02	04
5	GPS 11-14	Creating route, track and track back	-	02	02	04
6	GPS 15-16	Site and go, share wirelessly	-	02	-	02
7	GPS 17-26	Day Navigation from GPS.	-	10	-	10
8	GPS 27-32	Night Navigation from GPS.	-	-	06	06
9	GPS 33-34	GPS Revision	-	02	-	02
10	GPS 35-36	Skill test	-	02	-	02
<b>TOTAL</b>			<b>03</b>	<b>23</b>	<b>10</b>	<b>36</b>

## 4. GIS MODULE

140 PDS

Sl. No.	Code	Subject	DAY		Night	Total
			LEC	Guided Practice		
01	GIS 1-2	Introduction to internet and e-mail.	-	02	-	02
02	GIS 3-4	<b>GIS brief introduction and components of GIS</b>	02	-	-	02
03	GIS 5	<b>Why GIS in CRPF and GIS Tools used in CRPF</b>	01	-	-	01
04	GIS 6-13	<b>Introduction of Google earth &amp; its tool bar.</b>	02	04	02	08
05	GIS 14-15	<b>How to add point, Line, Polygon and picture and How to add Excel in Google Earth.</b>	01	01	-	02
06	GIS 16-31	Terrain analysis and ops planning on Google earth.	04	06	06	16
07	GIS 32-33	Security Related problem.	02	-	-	02
08	<b>GIS 34-35</b>	<b>Create and save KML/KMZ file.</b>	<b>01</b>	<b>01</b>	-	<b>02</b>
09	GIS 36-41	Creation, conversion and transfer of GDB File/KML Files for GPS using GPS Babel.	02	04	-	06
10	GIS 42-48	Introduction, function of map source and GPS track log analysis	02	03	02	07
11	GIS 49-52	Intro to base camp and file transfer.	01	03	-	04
<b>INSTALLATION AND FEATURE OF TERRA EXPLORER</b>						
12	<b>GIS 53-56</b>	<b>Introduction of Terra Explorer pro and introduction of TEP</b>	<b>02</b>	<b>02</b>	-	<b>04</b>
13	<b>GIS 57-58</b>	<b>Installation of TEP, Hands on TEP and Introduction all tabs</b>	<b>01</b>	<b>01</b>	-	<b>02</b>
14	GIS 59-61	Feature Layers- 1:1M, 1:250K, 1:50K, Satellite image.	01	02	-	03
15	GIS 62-64	Different features in Views, flight panel, containers etc.	01	02	-	03
16	GIS 65-67	Navigation facility.	01	02	-	03
17	GIS 68-70	Loading layers.	01	02	-	03
18	<b>GIS 71-73</b>	<b>Working with object like 2D,3D, Dynamic, Terrain etc.</b>	<b>01</b>	<b>02</b>	-	<b>03</b>
19	<b>GIS 74-77</b>	<b>Measurement Horizontal, Vertical, Aerial, Area, Contour</b>	<b>01</b>	<b>03</b>	-	<b>04</b>
20	<b>GIS 78-82</b>	<b>Terrain profile, line of sight , Best path, view shed analysis and Threat dome tool.</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>05</b>
21	GIS 83-85	Collaboration, find object, data library, snap shot.	01	02	-	03
22	GIS 86-88	Importing and exporting shape files.	01	02	-	03
23	GIS 89-91	Creation of routes.	01	02	-	03
24	<b>GIS 92-93</b>	<b>Creating OPS plan and exporting into various forms.</b>	<b>01</b>	<b>01</b>	-	<b>02</b>
25	<b>GIS 94</b>	<b>Introduction of QGIS and Converting spreadsheet into vector data and vice versa.</b>	<b>01</b>	-	-	<b>01</b>
26	<b>GIS 95</b>	<b>Handing of raster and vector data in QGIS and How to create point, Line,</b>	<b>01</b>	-	-	<b>01</b>

		<b>Polygon.</b>				
27	<b>GIS 96-97</b>	<b>Making map with QGIS and Hands on QGIS.</b>	<b>01</b>	<b>01</b>	<b>-</b>	<b>02</b>
<b>BHUSHAKTI (Enterprise application of TERRA explorer)</b>						
28	<b>GIS 98</b>	<b>Introduction of BHUSHAKTI and installation of Bhushakti</b>	<b>01</b>	<b>-</b>	<b>-</b>	<b>01</b>
29	<b>GIS 99</b>	<b>How to open Bhushakti home page through (SELO/VPN) and create User/edit/reset password in Bhushakti</b>	<b>01</b>	<b>-</b>	<b>-</b>	<b>01</b>
30	<b>GIS 100</b>	<b>Introduction to available datasets in Bhushakti</b>	<b>01</b>	<b>-</b>	<b>-</b>	<b>01</b>
31	<b>GIS 101</b>	<b>Features of Bhushakti and Hands on Bhushakti</b>	<b>01</b>	<b>-</b>	<b>-</b>	<b>01</b>
<b>SURYA ( Introduction of SURYA )</b>						
32	<b>GIS 102</b>	<b>Introduction of SURYA and how to open SURYA homepage through (SELO / VPN)</b>	<b>01</b>	<b>-</b>	<b>-</b>	<b>01</b>
33	<b>GIS 103-107</b>	<b>Training on various entry modules (1.Incident / Int Input, 2. FIR, 3. Terrorist / suspected inputs , 4. Intelligence Input, 5.Ops Plan, 6. IED, 7. Reports)</b>	<b>01</b>	<b>04</b>	<b>-</b>	<b>05</b>
34	<b>GIS 108-109</b>	<b>Hands on SURYA ( Incident / int report and FIR entry modules)</b>	<b>-</b>	<b>02</b>	<b>-</b>	<b>02</b>
35	GIS 110-112	Working with information tree.	01	02	-	03
36	GIS 113-115	Building of Viewer Kit.	01	02	-	03
37	GIS 116-119	Extraction of terrain data.	02	02	-	04
38	GIS 120-124	Practical on Terra Explorer Pro by using tools.	01	02	02	05
39	GIS 125-130	Revision of GIS	-	06	-	06
40	GIS 131-140	Skill test of GIS	-	10	-	10
		<b>TOTAL</b>	<b>46</b>	<b>80</b>	<b>14</b>	<b>140</b>



**5. MOBILE APPS NAVIGATION****60 PDS**

**Objective:-** At the end of training, trainees will be able to navigate with the help of various mobile apps like maverick, roux etc.

Sl. No	Code	Subject	DAY		Night	Total
			LEC	Guided Practice		
1.	MAN 1-4	Introduction to Maverick	02	02	-	04
2.	MAN 5-8	Feeding & editing of Way points Making KML/GPX	02	02	-	04
3.	MAN 9-28	DAY & NIGHT Navigation with the help of Maverick	-	10	10	20
4.	MAN 29-36	Data exchange with GIS	02	06	-	08
5.	MAN 37-40	Introduction to Orux & it's setting	02	02	-	04
6.	MAN 41-46	Finding and feeding of waypoints & making Route	02	04	-	06
7.	MAN 47-54	Creating Map & Ops planning	02	06	-	08
8.	MAN 55-60	Introduction & navigation with latest mobile apps*/ revision	02	04	-	06
<b>TOTAL</b>			<b>14</b>	<b>36</b>	<b>10</b>	<b>60</b>

**\* Periods allotted for navigation with latest mobile apps may be utilized for software coming in future, otherwise periods may be utilized for mobile navigation.**

**6. MISCELLANEOUS SUBJECT****50 PDS**

**Objective:-** At the end of training, trainees will be able to **prepare** sand model ,eye sketch, field sketch and enlargement for briefing purpose.

Sl. No	Code	Subject	DAY		Night	Total
			LEC	Guided Practice		
1	MS 1-2	Defense range card.	01	01	-	02
2	MS 3-10	Enlargement.	02	06	-	08
3	MS 11-20	Sketches and its preparation	02	08	-	10
4	MS 21-39	Cloth model, sand model, preparation and briefing.	04	15	-	19
5	MS 40-43	Preparation of Ops room	02	02	-	04
6	MS 44-45	Training methodology of navigation.	02	-	-	02
7	MS 46-50	Project work by trainees for instructor ability assessment purpose on navigation skill	-	05	-	05
<b>Total</b>			<b>13</b>	<b>37</b>	<b>-</b>	<b>50</b>

**\* During preparation of sand model, eye sketch etc, help of GIS software and satellite images must be taken for updated information purpose.**

## 7. UAV

04 PDS

Sl. No.	Code	Subject	DAY		Night	Total
			LEC	Guided Practice		
01	UAV -1	Overview of technology, Advantage to CRPF and Work flow of the data	01	-	-	01
04	UAV -2	Steps to capture data using drone Deploy app and how to install drone Deploy app	01	-	-	01
05	UAV -3	How to create project and fly drone using Drone Deploy app	01	-	-	01
06	UAV -4	Demonstration of 2DML images created through Phantom UAV using AGISOFT Meta shape	-	01	-	01
		<b>Total</b>	<b>03</b>	<b>01</b>	<b>-</b>	<b>04</b>

## 8. OPENING, CLOSING &amp; FINAL TEST (34 PERIODS)

Sl. No	Code	Subject	DAY	NIGHT	Total
1	OCF 1-2	Course overview & Opening Ceremony	02	-	02
2	OCF 3-4	Feedback & Closing ceremony	02	-	02
3	OCF 5-34	Final test	30		30
		<b>Total</b>	<b>34</b>	<b>-</b>	<b>34</b>

# TEST POLICY FOR NAVIGATIONAL SKILL COURSE

## (A)- KNOWLEDGE TEST

Sl no.	Subject	Mark
1	Topographical Map reading, compass navigation & miscellaneous subject.	200
2	GPS, GIS & Mobile navigational apps	200
	<b>Total</b>	<b>400</b>

## (B)- SKILL TEST

Sl no.	Subject	Mark
1	Terrain analysis by SOI map, contour study & OPS planning	100
2	Preparation of sand model and various types of sketches	50
3	Compass Navigation	50
4	GPS Navigation	50
5	Mobile apps navigation (Maverick, Orux)	50
6	Terrain analysis & Ops planning on GIS	100
	<b>Total</b>	<b>400</b>

## (C)- INSTRUCTIONAL ABILITY TEST FOR INSTRUCTOR GRADING

Sl n.	Subject	Mark
1		
	Note :- Each trainee will prepare 5 topics related to navigational subjects. Board of officers will select any one of them. The trainees will make presentation on the topic so allotted by board of officers. The trainees will be assessed based on the presentation / Topics regarding their ability for the instructions	
	Knowledge of subject	40
	Content preparation	40
	Delivery of content	40
	Interaction with class	40
	Confidence & Turn out	40
	<b>Total</b>	<b>200</b>
2	Internal Assessment by institution.	
	Discipline & punctuality	25
	Dedication & interest during course	25
	<b>Total</b>	<b>50</b>
	<b>Grand total</b>	<b>250</b>

## GRADING SYSTEM

Marks	Grading	
	Knowledge	Skill
70 % & above	'A'	'X'
60% & above but below 70%	'B'	'Y'
45% (Knowledge Part) and 50% (Skill Part) & above but below 60%	'C'	'Z'
	Fail Below <b>45%</b>	Fail Below <b>50%</b>

### NOTE-

1. At least 45% marks in each paper of knowledge section (Written test) are to be secured for minimum "C" grading.
2. At least 50% marks in aggregate in Skill Section (Outdoor test) are to be secured for minimum "Z" grading.

### INSTRUCTOR GRADING

Marks	Grading
Above 70% in Instructional ability test	<u>I</u>
<b>Note:- Only those trainees, who obtain AX, AY, BX, BY grading will be eligible as Instructor.</b>	

### COMPOSITION OF BOARD OF OFFICERS FOR FINAL TEST

Board of officers for final test will be detailed by the institution as per following composition:-

Presiding Officer	:	Commandant/Senior DC
Member-I	:	Dy.Comdt./Asstt.Comdt.
Member-II	:	Asst.Comdt.
Member-III	:	Insp/Sub Insp.

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