

**Vidyasagar University**  
**Curriculum for B. Sc (General) in**  
**Military Science**  
**[Choice Based Credit System]**

**Semester-IV**

Course	Course Code	Name of the Subjects	Course Type/ Nature	Teaching Scheme in hour per week			Credit	Marks
				L	T	P		
<b>DSC-1D</b>		DSC1DT: Military Technology and War, War Science and Technology in India, Warfare Technology, Military Technology and Training, Military Sociology and Military Psychology	Core Course	4	0	0	6	75
		- Practical		0	0	4		
<b>DSC-2D</b>	TBD	<b>DSC-2D(other Discipline)</b>	Core Course				6	75
<b>DSC-3D</b>	TBD	<b>DSC-3D (other Discipline)</b>	Core Course				6	75
<b>SEC-2</b>		SEC-2: Basics of Defence Journalism <b>Or</b> Cyber Security & Crime <b>Or</b> Laws of War	Skill Enhancement Course-2	1	1	0	2	50
<b>Semester Total</b>							<b>20</b>	<b>275</b>

**L** = Lecture, **T** = Tutorial, **P** = Practical, **CC** = Core Course, **TBD** = To be decided, **SEC** = Skill Enhancement Course.

**DSC-1** = Discipline Specific Core of Subject-1, **DSC-2** = Discipline Specific Core of Subject-2,

**DSC-3** = Discipline Specific Core of Subject-3.

## **List of the Core Courses (CC) and Electives**

### **Core Courses (CC)**

**DSC-1D: Military Technology and War, War Science and Technology in India, Warfare Technology, Military Technology and Training, Military Sociology and Military Psychology**

### **Skill Enhancement Course (SEC)**

**SEC-2: Basics of Defence Journalism**

**Or**

**SEC-2: Cyber Security & Crime**

**Or**

**SEC-2: Laws of War**

**Semester-IV**  
**Core Course (CC)**

**DSC-1D (CC-4): Military Technology and War, War Science and Technology in India, Warfare Technology, Military Technology and Training, Military Sociology and Military Psychology**

**Credits 06**

**DSC1DT: Military Technology and War, War Science and Technology in India, Warfare Technology, Military Technology and Training, Military Sociology and Military Psychology**

**Credits 04**

**Course Contents:**

**Unit-A: Military Technology in War**

**Science & Technology in war**

**a.** Science and war in the History (500 BC to up to date). Introduction to science, technology in war and different content. Impact of science and technology on human life with special reference to modern warfare. **b.** Defense and civil technology. Research and Development for war. Standardization of weapons system, economic factor of standardization, essentials for standardization. War and Environment. **c.** History, Uses, effects, Science for formation of nuclear bomb. Historical development and role of Nuclear (Atom) Bomb, Hydrogen Bomb, Cobalt or Dirty Bomb, Reduced Residual Radiation Bomb(RRR Bomb), Electro Magnetic Pulse Nuclear Bomb (EMP Nuclear Bomb), X Ray, Laser, Gamma Ray Laser. Effect of atomic / nuclear explosion. **d.** Nuclear fusion & Nuclear Fission – importance in development of war technology

**Unit-B: War Science and Technology in India**

**A. Science, Technology and National Security**

**1.** Military Technology and National Security. War science and technology in India. Development of armament technology in India since [1962 to till date]. Nuclear Technology in India. Indian Atomic / Nuclear Test and present Technology. Indian Atomic/ Nuclear Research Centers. Atomic/ Nuclear minerals with special reference in India.**2.** Introduction to emerging technologies.(a) Energy,(b) Electronics, Computers, nanotech and Artificial Intelligence,(c) Material Science,(d) Biotechnology,(e) Communications and Information Technology,(f) Transportation and vehicle technology. **3.** Application of technologies to:- (a) Armament and Weapon systems. (b) Missile Technology. (c) Communications and Radar technology. (d) Electronic Warfare and Information Warfare. (e) RNBC Warfare and Nuclear Energy. (f) Aircraft and Ships.(g) Satellite and Space technology.(h) Intelligence. (j) Logistics (transport, supplies, inventory, medical, repair, clothing and equipment).(k) Border Management. **4.** Impact of

developing technologies on Military Doctrine and conduct of warfare. **5.** Application of new technologies for Internal Security, Disaster Management, Training and Administration. **6.** Non military use of modern technologies and their impact on National Security (Power and energy, Trade, Economy, Banking, Media etc).

## **B. Science & Technology in Indian Military Services**

**a.** Impact of science & technology in society and warfare. Science & technology in Indian military services. **b.** Transfer of technology: Political, military & economic impact of transfer technology. Dual use of critical technology and its impact on Indian societies. **c.** Armament technology. Electronic & information warfare: Concept and application. Revolution of Military affairs (RMA). Ballistic Missile Defense (BMD): concept & application. **d.** History & significance of Defense Research and Development Organization (DRDO) - self sufficiency and dependence of weapons and armaments, Indian Space Research Organization, Military Hardware, Missile Development Program in India : Growth and development of India's Integrated Missile Development Program (IMDP). Unmanned Area Vehicle, Anti Satellite weapon, Directed Energy Weapons.

## **Unit-C: Warfare Technology**

### **Arms, weapons and Armaments**

A. Evolution of arms and armaments in art of war.

B. Modern weapons:

**1. Small Arms** - Theories of small arms. History, Characteristics, Design, variant, operating mechanism and military significance of following common arms used in Indian Army: Pistols & Revolvers - Glock, SAF Carbine, Heckler & Koch, Mouser, IM1 Galil sniper. .22 Rifle, .303 Rifle, 7.62 Self Loading Rifle SLR., INSAS LMG 5.56 mm Rifle. Light Machine Gun (LMG). Multi caliber Individual Weapon System (MCIWS). Sub machine carbine, Sten Machine Carbine. Modern Submachine Carbine (MSMC), **2. Artillery:** **a. Arms & Armaments:** Artillery Gun, Light Mortar: No 35 HE Grenade, 2 inch Mortar. AGS17 Plamy, AGS 30. Gun – Howitzer, Air Defense Gun: 40mm L-60 and L-70 BOFFORS GUN. Brief idea on: M77 Howitzer, DRDO 155 mm artillery gun, Dhanush Howitzer Indian Fields Gun, Light Fields gun, Gvozdika, smirch K58 MBRL, BM21. **b. Shell and Ammunition: Explosive, Rockets and Mortar.** Explosive: Properties & Types. **i)** High Explosive shell, Armored Piercing Shell, Smock Bomb. Mine Protected, Mine clearing and Mine laying Equipments: Brief idea on caspir, Tarmour, Hydrema, Aditya, DRDO Daksh. Combat - Arjun MBT, Bhishma, Ajeya, Surath. **ii) Missiles:** Rocket propulsive technology, Rocket Launcher and Multiple Rocket Launcher, Rockets – Guided Missiles – ICBM (Inter - continental Ballistic Missile). Anti Tank: Brief idea on Spike, Nag, MILAN, Kornet, Konkurs, Svir, Ataka, Helina. **iii) Nuclear explosive:** Brief idea. **3. Weapon Carriers:** Characteristics, mechanisms of operation, fire power and military importance of following: a. Land war weapon carrier - Battle Tank of India. b. Naval war weapon carrier - Naval crafts: Battle ship, Destroyer, Aircraft carrier, Frigate. Corvette, Mine sweeper, Submarine: Torpedo. c. Air war weapon carrier- Air craft mechanisms & flying principles: Strategic transport aircraft, Tactile transport aircraft. Military Glider, Military Helicopter Fighter airplane, Bomber, Fighter-Bomber Airplane. **4. Weapons of Mass Destruction:** i. Chemical & Biological Weapons: History, variant, uses. ii. Nuclear weapons: Nuclear Command Authority in India,

Strategic forces command, Indian land based nuclear armed ballistic missile : Brief idea on Prithvi, Agni, Surya, Indian Sea based nuclear armed ballistic missiles :Brief idea on Dhanush, Sagarika, Nuclear armed cruise missiles - Brief idea on Brahmos, Nirbhay. iii. Air Defense: Brief idea on Akash, Barak 8, Kub, Tungurka, F1M – 92, Stinger.

## Unit D: Military Technology and Training

**a. Weapon Training : Theoretical aspects of Weapon Training:** 1. Object of Weapon training. Types of weapons, parts, stripping and assembling of light guns. Characteristics of a rifle - rifle ammunition and its firepower. Rifle Mark III. 2. Stripping, assembling, care and cleaning and sight setting of .22 rifle. 3. Stripping, assembling, care and cleaning of 7.62mm SLR and its loading cocking and unloading. 4. Rules of Aiming. Firing position. The lying position, Holding & aiming. 5. Trigger control and firing a shot. 7. Range procedure and safety precautions. 8. Theory of Group and Snap shooting. 9. Short range firing, Aiming – Alteration of sight. 10. Rifle firing and follow up practice. 11. Parts of heavy weapons, stripping and assembling of heavy weapons. 12. Essentials of Good Shooting. **b. Field Craft, Battle Craft:** Introduction. Judging Distance and its methods. Description of ground. Recognition, description and indication of landmarks & targets. Observation, Camouflage and Concealment. Field Signals. Section Formations. Section Battle Drill. Fire fighting. Fire Control Orders. Fire and Movement. Knots and Lashings. Section Battle Drill. **c. Communication process:** Communication- main elements, types and methods of communications, media. Communication systems- internet, Faxi mail, Satellites. Characteristics of Wireless Technology (Mobile, Wi Fi, etc). Characteristics of Walkie /Talkie. Basic Radio Telephony (RT) Procedure. Military Language. Latest trends and development (Multi Media, Video Conferencing, IT). Information system and type of information. Signals- introduction to radio, telephony procedure. Field signals. Air raid warnings. **d. Field Engineering:** Principles and applications, camouflage and concealment. Section formation. Mines and types of mines fields, anti tanks and explosive. **e. Adventure Training:** Introduction to adventure Training, Planning Organization & Conduct. Cycle & Trekking Expeditions. Organization & Conduct of Sightseeing. Spirit of Mountaineering. Selection of camp site Layout & Sanitation in camp.

## Unit-E: Military Sociology and Military Psychology

**a. Military Sociology:** a) Study of Society, Social groups, social interaction: motivation, morality. Social effects of war. Post war social problems. Social background of military personnel of India. **b) Armed Force and Society:** Role of Indian Armed force in society and inter-dependence, military aid to civil authorizes. **c) Indian Armed Forces and Disaster Management.** War and disaster. **d) Overseas bases and relations – peace keeping – anti piracy and exploration mission.** **e) Military Coups:** causes and its consequences on society. **f) Problem of ex-service men of India.** Benefits of service for *Jawans* and Officers. One man one person demands. women in Armed forces.

**b. Military Psychology:** Military Psychology – Concept, historical development, role, aim and importance. Development of military psychology: concept, scope & significance. Psychology in the defense problems. Psychology in war and peace. Use of the psychology in the war and military use of Psychology. Psychology in the Military training. Personal adjustment factors in adjustment during army life, the recruits of adjustment to combat. Problem of adjustment and the problem of Re-adjustment of ex-soldiers. War neurosis : Causes, symptoms and efforts. Fear & panic in war : causes, consequences and management – emotional problem and adjustment during war & peace.

**Psychological warfare:** Concept, utility, types, propaganda, Rumor, corrosive presentation, brain washing methods.

**c. Human factors as military instruments:** **i.** Armed force and Individual factors: Intelligence personality. Group dynamics and military life: structure, type and function. **ii.** The Eye as military instruments: visual adaptation and Night vision, Color and Camouflage, color and color blindness, camouflage and counter camouflage. **iii.** The Ear as a military instruments : nature of hearing, psychology of hearing, Deafness and communication. Effect of noise, localization of objects by hearing, sound camouflage, practical rules of hearing. **iv.** The nose as military instruments: smell in war, sensitivity, Reorganization, war gases, Camouflage of odors.

## **DSC1DP: Practical**

**Credits 02**

### **A. Weapons and Armaments:**

**1.** Demonstrate following arms: **a.** Rifles: .22 Rifles. .303 Rifle, 7.62 Self Loading Rifle SLR, INSAS LMG 5.56 mm. Rifles. Light Machine Gun (LMG), Multi caliber Individual Weapon System (MCIWS), Sten Machine Carbine. Modern Submachine Carbine (MSMC), Sten Machine Carbine. Pistol & Revolvers. **b.** Area weapons used commonly in Indian army: No 36 HE Grenade, 2 inch Mortar.

Students will require drawing and explaining the important stages of mechanisms of the above weapons.

**2.** Students will be required to draw sectional diagrams showing the parts connected with the mechanisms of movements and firing of the following armaments: Artillery Gun, Howitzer, Air Defense Gun: 40mm L-60 and L-70 BOFFORS GUN. Indian Field gun 105 mm. Tanks, Air craft, Submarine, Torpedo. Smock Bomb. Multiple Rocket Launchers. Modern military Airplanes: Fighter airplanes, Bombing airplanes – supersonic Mig-21,27,29, Light air craft Tejas. Others fighter jets currently operates : Mirage-2000, Sukhoi Su-30MKI, Jaguar, HAL Tejas LCA. Helicopters. Naval Ships - Frigates, Destroyers, Submarine and Torpedo.

### **B. Weapon Training**

Stripping as aiming & Sight setting of Rifle. Lying position ‘and hold’, including bolt manipulation. Trigger control and firing a shot. Aiming, Range figures targets–Range procedure and safety precautions. Alteration of Sight and firing shots. Firing in different wind conditions. Range classification firing. On Guard hip firing. The point 2 point. Training sticks (Self defense & attack). LMG - Stripping, assembling, piston group and barrel. LMG - Loading, unloading, Sight, aiming and holding.

### **C. Weapon Training - Field craft, Battle craft, Patrolling and Field engineering:**

1. Judging distance and indication of targets. 2. Camouflage & Concealment 3. Fire discipline & Fire control order. 4. Observation and Concealment exercise. 5. Simple Verbal orders. 6. Field Signals 7. Section battle drill.

### **D. Adventure training:**

Parasailing, Sailing, Slithering, Rock climbing, Cycling and trekking.

### **E. Field visit**

Field visit to military establishment/ Base for the demonstration of different weapons, armaments and weapon carriers.

#### **F. Project Report & Tour Report**

i) Project report based on Field visit to military establishment / places of military interest. ii) Tour report pertaining to different defense establishment and geo-strategic areas of importance.

#### **G. Laboratory Note Books and Viva Voce**

Students will be required to maintain records of all works done in connection with the topic taught in this paper.

### **Skill Enhancement Courses (SEC)**

#### **SEC-2: Basics of Defence Journalism**

**Credits 02**

#### **SEC2T: Basics of Defence Journalism**

##### **Course Contents:**

**UNIT-I:** Introduction a) Defence Journalism – its features b) Civil Journalism & Defence journalism differences c) Defence Writing – Need for specialist d) Defence Journalism – As a Profession

**UNIT-II :** Defence News a) Meaning and Defining Defence News b) Kinds of Sources of defence News c) Defence Writing Procedure

**UNIT-III :** Defence Reporting a) Format languages and grammar b) Forms – Eye witness, computer assigned features c) Concept of Graphics and Animation (Role of Modern Technology)

**UNIT-IV :** Defence Terminology a) Defence terms & Abbreviations b) Military terms – Weapons, Weapons system c) Defence organization – Rank and Rank structure in the services in India

**UNIT-V:** Problem in Defence writing a) Media Ethics b) Media Laws c) Problem in Defence Writing – Political Pressure Official Secrecy – etc., d) Introducing existing defence Journals Sainik, Samachar, Trishul, Strategic Digest ,Strategic Analysis etc.

**Or**

#### **SEC-2: Cyber Security & Crime**

**Credits 02**

#### **SEC-2T: Cyber Security & Crime**

##### **Course Contents:**

**Unit I:** Introduction to Cyber Technologies. Information Systems - Networks/LAN/WAN - Military Sensors.

**Unit II:** Types of Cyber Crime. Hacking - Password Cracking - Insecure Network Connection – Theft at Tele Communication Services.

**Unit III:** Impact of Cyber Crime on National Security. Impact on Armed Forces & Law enforcement Agencies' Information Systems - Impact on National Economy/Market - Impact on Citizen Security.

**Unit IV:** Detection and Prevention methodologies. Risk Identification - Levels of Protection - Cyber Defensive Measures.

**Unit V:** Cyber Laws. Overview of General Laws and Procedures in India - Introduction to Indian Cyber Law - Cyber Crime and Digital Evidence- Indian Perspective.

**Or**

**SEC-2: Laws of War**

**Credits 02**

**SEC-2T: Laws of War**

**Course Contents:**

**Unit-I:** Laws of War – I: War in General and characteristic of war. War, its legal character and effects. Enemy character, termination of war and Laws relating to POWs.

**Unit-II:** Laws of War – II: Laws of land warfare. Belligerent occupation. Laws of maritime warfare. Laws of aerial warfare. Warfare of Land – violence against enemy persons; treatment of wounded, the sick and the dead; capacity; appropriation and use of enemy public and private property, Assault, siege and bombardment. Espionage – occupation of enemy territory.

**Unit-III:** International Law: Basis, nature, source, conditions and function of international law. Historical development of International Law. Subjects of International law. Status domain; Limitation of state; settlements of disputes. International Court of justice, Settlement of International Disputes (Amicable).