Magnetism and Electromagnetic Induction

VIDEO LECTURE INDEX / 7 CHAPTERS

07	187	68:43:19
CHAPTERS	LECTURES	TOTAL VIDEO TIME

Lecture prefixes standardized from Meg_ to MAG_. Durations total 68:43:19.

CHAPTER 01 | Magnetic field and magnetic forces

#	CH. #	LECTURE / TOPIC	DURATION
1	1	MAG_Ch1_1_Force on a Charged Particle Moving in Magnetic Field	00:18:33
2	2	MAG_Ch1_2_Force on a Charged Particle Moving in Magnetic Field Illustrations	00:28:06
3	3	MAG_Ch1_3_Force on a Charged Particle Moving in Magnetic Field Illustrations	00:33:07
4	4	MAG_Ch1_4_Charged particle projected normal to Magnetic Field- Circular path p1	00:34:10
5	5	MAG_Ch1_5_Charged particle projected normal to Magnetic Field- Circular Path Illustrations	00:38:51
6	6	MAG_Ch1_6_Charged particle projected normal to Magnetic Field- Circular Path Illustrations	00:32:38
7	7	MAG_Ch1_7_Motion of a charged particle moving in Magnetic Field- Helical Path	00:24:05
8	8	MAG_Ch1_8_Motion of a charged particle moving in Magnetic Field- Helical Path illustrations	00:17:20
9	9	MAG_Ch1_9_Motion of a charged particle moving in Magnetic Field- Helical Path illustrations	00:24:47
10	10	MAG_Ch1_10_ Motion of a charged particle moving in Magnetic Field - Cyclotron	00:19:36
11	11	MAG_Ch1_11_Force on a charged particle moving in non-uniform Magnetic Field	00:14:29
12	12	MAG_Ch1_12_Force on a current carrying wire in Magnetic Field	00:22:13
13	13	MAG_Ch1_13_ Force on a current carrying wire in Magnetic Field illustrations	00:26:49
14	14	MAG_Ch1_14_Magnetic Dipole and Dipole moment	00:31:30

CHAPTER 01 | Magnetic field and magnetic forces · CONTINUED

#	CH. #	LECTURE / TOPIC	DURATION
15	15	MAG_Ch1_15_Magnetic Dipole and Dipole moment illustrations	00:31:03
16	16	MAG_Ch1_16_Torque on A Current Carrying Planar Loop in A Uniform Magnetic Field p1	00:33:55
17	17	MAG_Ch1_17_Torque on A Current Carrying Planar Loop in A Uniform Magnetic Field Illustrations	00:18:40
18	18	MAG_Ch1_18_Torque on A Current Carrying Planar Loop in A Uniform Magnetic Field Illustrations	00:23:04
19	19	MAG_Ch1_19_Energy of Magnetic Dipole	00:19:43
20	20	MAG_Ch1_20_Energy of Magnetic Dipole illustrations	00:19:36
SOLVED EXAMPLES			
21	21	MAG_Ch1_1_Motion of a charged particle in uniform magnetic field -Circular path	00:11:34
22	22	MAG_Ch1_2_Motion of a charged particle in uniform magnetic field -Helical path	00:09:57
23	23	MAG_Ch1_3_Motion of a charged particle in uniform magnetic field -Helical path	00:10:58
24	24	MAG_Ch1_4_Motion of a charged particle in uniform magnetic field	00:17:21
25	25	MAG_Ch1_5_Motion of a charged particle in uniform magnetic field -Helical path	00:15:45
26	26	MAG_Ch1_6_Motion of a charged particle in Electric and uniform magnetic field	00:10:55
27	27	MAG_Ch1_7_Motion of a charged particle in Electric and uniform magnetic field	00:14:50
28	28	MAG_Ch1_8_Motion of a charged particle in Combined and uniform magnetic field	00:13:31
29	29	MAG_Ch1_9_Motion of a charged particle in non-uniform magnetic field	00:13:47
30	30	MAG_Ch1_10_Motion of a charged particle in Combined and Electric and magnetic field	00:27:00
31	31	MAG_Ch1_11_Force on a current carrying wire in magnetic field	00:09:50
32	32	MAG_Ch1_12_Torque on current carrying loop in magnetic field	00:14:50
33	33	MAG_Ch1_13_Torque on current carrying loop in magnetic field	00:13:39

CHAPTER 01 | Magnetic field and magnetic forces · CONTINUED

#	CH. #	LECTURE / TOPIC	DURATION
34	34	MAG_Ch1_14_Torque on current carrying loop in magnetic field	00:16:01
		CHAPTER 01 TOTAL · 34 lectures	**11:52:13**

CHAPTER 02 | Sources of Magnetic Field

#	CH. #	LECTURE / TOPIC	DURATION
35	1	MAG_Ch2_1_Magnetic Field Due to Current Carrying Wire -Biot & Savart Law	00:25:51
36	2	MAG_Ch2_2_Magnetic Field Due to Current Carrying Wire -Biot & Savart Law Illustrations	00:24:15
37	3	MAG_Ch2_3_Magnetic Field Due to Current Carrying Wire - Biot & Savart Law illustrations	00:23:12
38	4	MAG_Ch2_4_Magnetic Field Due to Current Carrying Wire - Biot & Savart Law illustrations	00:25:53
39	5	MAG_Ch2_5_Magnetic Field Due to Current Carrying Wire - Biot & Savart Law illustrations	00:22:24
40	6	MAG_Ch2_6_Magnetic Field Due to Current Carrying Wire - Biot & Savart Law illustrations	00:16:46
41	7	MAG_Ch2_7_Magnetic Field Due to Current Carrying Wire - Biot & Savart Law illustrations	00:23:50
42	8	MAG_Ch2_8_Magnetic Field due to long conducting sheet of current-Biot & Savart law	00:19:56
43	9	MAG_Ch2_9_Magnetic Field due to long conducting sheet of current-Biot & Savart law illustrations	00:12:27
44	10	MAG_Ch2_10_Magnetic Field at the centre of the current carrying circular arc and circular loop-Biot & Savart law	00:15:48
45	11	MAG_Ch2_11_Magnetic Field at the centre of the current carrying circular arc and circular loop-Biot & Savart law illustrations	00:19:18
46	12	MAG_Ch2_12_Magnetic Field at the centre of the current carrying circular arc and circular loop-Biot & Savart law illustrations	00:20:51
47	13	MAG_Ch2_13_Magnetic Field at The Axis of a Circular Ring	00:20:41
48	14	MAG_Ch2_14_Magnetic Field at The Axis of a Circular Ring illustrations	00:10:25

CHAPTER 02 | Sources of Magnetic Field · CONTINUED

#	CH. #	LECTURE / TOPIC	DURATION
49	15	MAG_Ch2_15_ Magnetic Field Inside a Long Solenoid	00:14:29
50	16	MAG_Ch2_16_Magnetic Field at The Centre of a Rotating Non-Conducting Charged sphere	00:14:35
51	17	MAG_Ch2_17_ Force on A Current Carrying Wire Placed in The Magnetic Field of An Other Current-Carrying Wire p1	00:27:31
52	18	MAG_Ch2_18_ Force on A Current Carrying Wire Placed in The Magnetic Field of An Other Current-Carrying Wire p2	00:13:59
53	19	MAG_Ch2_19_ Force on a current carrying wire placed in the magnetic field of another current carrying wire Illustrations	00:16:42
54	20	MAG_Ch2_20_ Force on a current carrying wire placed in the magnetic field of another current carrying wire Illustrations	00:28:57
55	21	MAG_Ch2_21_Force on a current carrying wire placed in the magnetic field of another current carrying wire Illustrations	00:22:45
56	22	MAG_Ch2_22_ Ampere's Law p1	00:30:09
57	23	MAG_Ch2_23_ Ampere's Law p2	00:18:22
58	24	MAG_Ch2_24_ Ampere's Law Illustrations	00:32:32
59	25	MAG_Ch2_25_ Magnetic Induction due to a cylindrical wire	00:31:45
60	26	MAG_Ch2_26_ Magnetic Induction due to a Hollow cylindrical wire	00:12:41
61	27	MAG_Ch2_27_ Magnetic Induction due to a Hollow cylindrical wire illustrations	00:29:20
62	28	MAG_Ch2_28_ Magnetic Field due to a conducting sheet of current	00:29:25
63	29	MAG_Ch2_29_ Calculating the magnetic field of a solenoid and toroid by using Ampere's Law	00:31:15
SOLVED EXAMPLES			
64	30	MAG_Ch2_1_Application of Ampere's Law	00:11:36
65	31	MAG_Ch2_2_Application of Biot and Savart Law	00:16:09
66	32	MAG_Ch2_3_Application of Biot and Savart Law	00:14:10
67	33	MAG_Ch2_4_Application of Biot and Savart Law	00:19:43

CHAPTER 02 | Sources of Magnetic Field · CONTINUED

#	CH. #	LECTURE / TOPIC	DURATION
68	34	MAG_Ch2_5_Application of Biot and Savart Law	00:16:47
69	35	MAG_Ch2_6_Application of Biot and Savart Law	00:18:02
70	36	MAG_Ch2_7_Force between two parallel current carrying wires and simple harmonic motion	00:14:14
71	37	MAG_Ch2_8_Application of Biot and Savart Law	00:27:24
72	38	MAG_Ch2_9_Application of Biot and Savart Law	00:16:32
73	39	MAG_Ch2_10_Finding torque on a closed current carrying loop placed in non-uniform magnetic field	00:16:06
74	40	MAG_Ch2_11_Energy of a magnetic dipole conservation of a angular momentum and energy	00:19:47
75	41	MAG_Ch2_12_Magnetic field due to a long conducting sheet of current	00:12:27
76	42	MAG_Ch2_13_Application of method of symmetry or calculation of magnetic field	00:09:22
77	43	MAG_Ch2_14_Finding magnetic field between the plates of a moving charged capacitor	00:13:51
78	44	MAG_Ch2_15_Finding magnetic field inside a long cylindrical dielectric rod rotating about its axis	00:13:42
79	45	MAG_Ch2_16_Application of Ampere's law	00:17:01
80	46	MAG_Ch2_17_Finding magnetic field to a rotating charged laminar body	00:09:27
		CHAPTER 02 TOTAL · 46 lectures	**15:02:24**

CHAPTER 03 | Permanent Magnets and Magnetic Properties of matter

#	CH. #	LECTURE / TOPIC	DURATION
81	1	MAG_Ch3_1_Bar Magnet	00:30:22
82	2	MAG_Ch3_2_Bar Magnet Magnetic Dipole Moment	00:13:42
83	3	MAG_Ch3_3_Magnetic Field of Bar Magnet p1	00:31:51
84	4	MAG_Ch3_4_Magnetic Field of Bar Magnet p2	00:18:23
85	5	MAG_Ch3_5_Torque and potential energy	00:34:57
86	6	MAG_Ch3_6_The Earths magnetism	00:11:37
87	7	MAG_Ch3_7_Magnetic elements of earth	00:24:22
88	8	MAG_Ch3_8_Finding Magnetic moment of bar magnet and neutral points	00:34:09
89	9	MAG_Ch3_9_Deflection magnetometer	00:15:44
90	10	MAG_Ch3_10_Tangent Galvanometer	00:19:49
91	11	MAG_Ch3_11_Vibration magnetometer	00:37:51
92	12	MAG_Ch3_12_Ferrgomagnetism	00:12:02
93	13	MAG_Ch3_13_Magnetic Properties of materials	00:37:50
94	14	MAG_Ch3_14_Classification of materials p1	00:27:18
95	15	MAG_Ch3_15_Classification of materials p2	00:19:26
96	16	MAG_Ch3_16_Magnetic Hysteresis p2	00:26:18
97	17	MAG_Ch3_17_Magnetic Hysteresis	00:24:01
		CHAPTER 03 TOTAL · 17 lectures	**06:59:42**

CHAPTER 04 | Electromagnetic Induction

#	CH. #	LECTURE / TOPIC	DURATION
98	1	MAG_Ch4_1_Magnetic Flux	00:16:58
99	2	MAG_Ch4_2_Magnetic Flux Illustrations	00:29:16
100	3	MAG_Ch4_3_Work Done in Changing Orientation of a Current Carrying Coil in Magnetic Field	00:28:35
101	4	MAG_Ch4_4_Faradays law of Electromagnetic induction	00:29:07
102	5	MAG_Ch4_5_Faradays law of Electromagnetic induction Illustrations	00:27:55
103	6	MAG_Ch4_6_Faradays law of Electromagnetic induction Induced Charge	00:09:08
104	7	MAG_Ch4_7_Faradays law of Electromagnetic induction Lenz’s Law 1	00:15:19
105	8	MAG_Ch4_8_Faradays law of Electromagnetic induction Lenz’s Law 2	00:23:24
106	9	MAG_Ch4_9_Faradays law of Electromagnetic induction illustrations	00:33:00
107	10	MAG_Ch4_10_Faradays law of Electromagnetic induction illustrations	00:23:17
108	11	MAG_Ch4_11_Motional Electromotive Force	00:39:19
109	12	MAG_Ch4_12_Motional Electromotive Force illustrations	00:32:06
110	13	MAG_Ch4_13_Motional Electromotive Force illustrations	00:23:54
111	14	MAG_Ch4_14_Motional Electromotive Force illustrations	00:24:41
112	15	MAG_Ch4_15_Motional Electromotive Force Emf Across Rotating Straight Conductor	00:40:25
113	16	MAG_Ch4_16_Motional Electromotive Force Emf Across Rotating conductor of Arbitrary shape	00:30:22
114	17	MAG_Ch4_17_Motional Electromotive Force Emf Across metallic rotating in form of a conical pendulum	00:13:58
115	18	MAG_Ch4_18_Time Varying Magnetic field -Induced Electric Field	00:30:06
116	19	MAG_Ch4_19_Time Varying Magnetic field -Finding magnitude of Induced Electric Field	00:23:17
117	20	MAG_Ch4_20_Time varying Induced Electric field illustrations	00:26:27

CHAPTER 04 | Electromagnetic Induction · CONTINUED

#	CH. #	LECTURE / TOPIC	DURATION
118	21	MAG_Ch4_21_Time varying Induced Electric field illustrations	00:30:02
SOLVED EXAMPLES			
119	22	MAG_Ch4_1_Illustration Induced Electric Field	00:25:53
120	23	MAG_Ch4_2_Illustration Motional EMF	00:12:35
121	24	MAG_Ch4_3_Illustration Motional EMF	00:10:41
122	25	MAG_Ch4_4_Illustration Motional EMF	00:15:03
123	26	MAG_Ch4_6_Illustration Motional EMF	00:16:24
124	27	MAG_Ch4_7_Illustration Motional EMF	00:20:19
125	28	MAG_Ch4_8_Illustration Faraday’s law for shm & emi	00:18:16
126	29	MAG_Ch4_9_illustration Induced Electric Field in Time varying Magnetic Field	00:20:45
127	30	MAG_Ch4_10_illustration Induced Electric Field in Time varying Magnetic Field	00:24:39
128	31	MAG_Ch4_11_illustration Faradays law of emi and motional emf in induced electric field	00:34:24
129	32	MAG_Ch4_12_illustration Finding velocity of a conducting disc falling in uniform magnetic field	00:18:41
130	33	MAG_Ch4_13_illustration Motional EMF	00:12:32
131	34	MAG_Ch4_14_illustration Force on a current carrying conductor moving in magnetic field Motional EMF & SHM	00:20:28
		CHAPTER 04 TOTAL · 34 lectures	13:21:16

CHAPTER 05 | Inductance

#	CH. #	LECTURE / TOPIC	DURATION
132	1	MAG_Ch5_1_Self Inductance	00:26:02
133	2	MAG_Ch5_2_Self Inductance Illustrations	00:29:54
134	3	MAG_Ch5_3_Mutual Inductance and Illustrations	00:35:42
135	4	MAG_Ch5_4_Combined Mutual and Self induction	00:17:34
136	5	MAG_Ch5_5_Combined Mutual and Self-induction illustrations	00:31:38
137	6	MAG_Ch5_6_Combination of inductors	00:32:08
138	7	MAG_Ch5_7_Combination of inductors illustrations	00:12:25
139	8	MAG_Ch5_8_Inductors in Electrical Circuits P1	00:19:10
140	9	MAG_Ch5_9_Inductors in Electrical Circuits P2	00:24:27
141	10	MAG_Ch5_10_Growth and decay of current-inductors with resistor circuits	00:21:21
142	11	MAG_Ch5_11_Growth and decay of current-inductors with resistor circuits Illustrations	00:32:27
143	12	MAG_Ch5_12_Energy stored in magnetic field of an inductor	00:17:47
144	13	MAG_Ch5_13_Energy stored in magnetic field of an inductor illustrations	00:20:12
145	14	MAG_Ch5_14_Finding total energy stored in two current carrying coils placed near to each other	00:27:13
146	15	MAG_Ch5_15_Inductors and capacitor circuits Lc Oscillation	00:30:22
147	16	MAG_Ch5_16_Inductors and capacitor circuits Lc Oscillation Illustrations	00:30:38
148	17	MAG_Ch5_17_Inductors and capacitor circuits Lc Oscillation Illustrations	00:34:52
SOLVED EXAMPLES			
149	18	MAG_Ch5_1_Illustration Analysis decay of magnetic field in function of time inside a hollow metallic cylinder	00:21:56
150	19	MAG_Ch5_2_Illustration Analysing RL circuit	00:21:18

CHAPTER 05 | Inductance · CONTINUED

#	CH. #	LECTURE / TOPIC	DURATION
151	20	MAG_Ch5_3_Illustration Learning Behaviour of inductor and capacitor in circuit	00:22:04
152	21	MAG_Ch5_4_Illustration EMF due to rotation of metal rod	00:15:01
153	22	MAG_Ch5_5_Illustration Self-inductance and toroid coil	00:07:54
154	23	MAG_Ch5_6_Illustration LC Circuit with two charged Capacitor	00:22:35
155	24	MAG_Ch5_7_Illustration Application of Kirchhoff’s law in inductor capacitor and resistance	00:21:53
156	25	MAG_Ch5_8_Illustration Analysis RL circuit	00:13:25
157	26	MAG_Ch5_9_Illustration Analysing RL circuit	00:16:55
158	27	MAG_Ch5_10_Illustration Analysing RL circuit	00:13:23
159	28	MAG_Ch5_11_Illustration inductor in circuit Motional EMf and SHM	00:19:00
160	29	MAG_Ch5_12_Illustration Analysing RL circuit	00:15:43
		CHAPTER 05 TOTAL · 29 lectures	**10:54:59**

CHAPTER 06 | Alternating Current

#	CH. #	LECTURE / TOPIC	DURATION
161	1	MAG_Ch6_1_Alternating current and voltage	00:28:09
162	2	MAG_Ch6_2_Phasor Analysis	00:18:01
163	3	MAG_Ch6_3_Average Value and Effective Value p1	00:29:29
164	4	MAG_Ch6_4_Average Value and Effective Value p2	00:12:36
165	5	MAG_Ch6_5_Average Value and Effective Value p3	00:12:48
166	6	MAG_Ch6_6_AC circuit with one circuit element 1	00:19:23
167	7	MAG_Ch6_7_AC circuit with one circuit element 2	00:22:08
168	8	MAG_Ch6_8_AC circuit with one circuit element illustrations	00:11:08
169	9	MAG_Ch6_9_AC applied to CR and LR circuits p1	00:26:00
170	10	MAG_Ch6_10_AC applied to CR and LR circuits p2	00:21:40
171	11	MAG_Ch6_11_AC applied to CR and LR circuits illustrations	00:32:56
172	12	MAG_Ch6_12_AC circuit containing resistor inductor and capacitor in series (LCR ciccuit)	00:25:08
173	13	MAG_Ch6_13_AC circuit containing resistor inductor and capacitor in series (LCR ciccuit) illustrations	00:29:32
174	14	MAG_Ch6_14_Power in AC Circuits	00:22:14
175	15	MAG_Ch6_15_Choke coil	00:10:31
176	16	MAG_Ch6_16_Resonance in LCR circuits	00:33:49
177	17	MAG_Ch6_17_Resonance in Series LCR circuits half power frequencies,bandwidth in series,RLC circuits factors of resonance	00:37:24
178	18	MAG_Ch6_18_Transformers	00:27:53
179	19	MAG_Ch6_19_Transformers Illustrations	00:22:35
		CHAPTER 06 TOTAL · 19 lectures	**07:23:24**

CHAPTER 07 | Electromagnetic Waves

#	CH. #	LECTURE / TOPIC	DURATION
180	1	MAG_Ch7_1_Maxwells displacement current	00:30:12
181	2	MAG_Ch7_2_Maxwells displacement current illustrations	00:32:14
182	3	MAG_Ch7_3_Maxwells displacement current illustrations	00:19:41
183	4	MAG_Ch7_4_Maxwells displacement current illustrations	00:14:20
184	5	MAG_Ch7_5_Maxwells Equations and Prediction of Electromagnetic waves	00:24:32
185	6	MAG_Ch7_6_Maxwells Equations and Prediction of Electromagnetic waves illustrations	00:19:39
186	7	MAG_Ch7_7_Energy density intensity and momentum of electromagnetic waves	00:25:30
187	8	MAG_Ch7_8_Energy density intensity and momentum of electromagnetic waves illustrations	00:23:13
		CHAPTER 07 TOTAL · 8 lectures	**03:09:21**