

## General Table of Contents

(Grey shading = new lectures)

### 1000 Aluminium Materials Technology (AMT), (21 modules, 495 pages, 451 figures, 28 text files, 21 overhead files)

	Pages / Figures
<b>1100 Production, Markets, Environment</b>	1/0
1100-01 Introduction Aluminium and light metal	10/10
1101 Resources and production of aluminium	25/25
1102 Environmental factors	16/14
<b>1200 Aluminium Metallurgy</b>	2/0
1201 Introduction to Aluminium as an Engineering Material	22/26
1202 Metallography of Aluminium Alloys	20/7
1203 Phase Diagrams	14/13
1204 Precipitation Hardening	47/60
1205 Introduction to Mechanical Properties, Casting, Forming, Joining and Corrosion	12/9
1251 Mechanical Working / Forming of Shapes	14/14
1252 Corrosion and Corrosion Protection	17/15
1253 Creep of Aluminium and Aluminium Alloys	26/20
1254 Fatigue in Al Casting Alloys : metallurgical aspects	16/8
1255 Metallurgical Background to Alloy Selection and Specifications for Wrought, Cast and Special Applications	16/17
<b>1300 Production and Properties of Semi-finished Products</b>	1/0
1301 Rolling: The process and the product	24/29
1302 Extrusions: Alloys, shapes and properties	16/23
<b>1400 Advanced Aluminium Materials</b>	1/0
1401 Aluminium powder metallurgy	26/25
1402 Aluminium matrix composite materials	28/29
1410 Aluminium foam	24/16
<b>1500 Aluminium Alloys; Properties and Selection Criteria</b>	1/0
1501 Properties, characteristics and alloys	60/44
1502 Criteria in material selection	36/38
<b>1600 Advanced Metallurgical and Material Science Topics</b>	1/0
1601 Process modelling age-hardening	19/9
	Total :
	<b>495/451</b>

## 2000 Aluminium Design (AD)

(65 modules, 1369 pages, 819 figures, 77 text files, 34 overhead files)

	Pages / Figures
<b>2100 Aluminium in Product Development (APD)</b>	1/0
2101 Materials and product development process	1/0
2101.01 Understanding aluminium as a material	23/21
2101.02 The product development process	12/11
2102 Case studies in product development:	1/0
2102.01 A Floodlight for an Offshore Oil Platform, Special Study: Extruding Aluminium	22/30
2102.02 An Upper Casing for an Automobile Steering Column, Special Study: Impact Extrusion	15/16
2102.03 The Transmission Housing of an Inboard-Outboard Engine, Special Study: Casting	25/26
2102.04 A Compressed Air Tank for a Lorry, Special Studies: Rolling, Deep-Drawing and Welding Aluminium	28/30
2104 Case studies in building applications:	1/0
2104.01 Case Study on Glass Roof	21/23
2104.02 Case Study on Windows	18/18
2105 Case studies in general engineering:	1/0
2105.01 Case Study on Pressure vessels	19/16
2109 LCA - from environmental consciousness to design for the future	9/2
2110 Life cycle analysis (LCA)	1/0
2110.01 Automobile brake rotor - LCA in product design	31/26
2110.02 Product information structure, business concept and LCA	13/9
<b>2200 Introduction to Structural Design (ASD)</b>	1/0
2201.01 State of the Art	17/15
2202 Structural aluminium materials	28/10
2203 Structural materials fabrication	42/26
2204 Design philosophy (updated from TAS project)	30/10
2205 Special design issues	24/31
	Total :
	<b>384/290</b>

## 2000 Aluminium Design (AD, following 1)

	Pages / Figures
<b>2300 Static Design</b>	1/0
2301 Design of members	125/92
2301 Design of Members examples	2/0
1. Example 3.1 Deflection of class 4 cross section	5/0
2. Example 4.1 : Bending moment resistance of open cross section with closed part	7/0
3. Example 4.2 : Hollow cross section (polygon)	5/0
4. Example 4.3 : Bending moment resistance of welded hollow section with outstands. Class 2 cross section	10/0
5. Example 4.4 : Bending moment resistance of welded hollow section with outstands. Class 4 cross section	10/0
6. Example 5.1 : Axial force resistance of square hollow section	2/0
7. Example 5.2 : Axial force resistance of symmetric hollow extrusion	4/0
8. Example 5.3 : Resistance of cross section with radiating outstands	6/0
9. Example 5.4 : Axial force resistance of channel cross section,	7/0
10. Example 5.5 : Axial force resistance of laced column	3/0
11. Example 5.6 : Axial force resistance of orthotropic plate. Open or closed stiffeners	5/0
12. Example 5.7 : Axial force resistance of orthotropic double-skin plate	9/0
13. Example 6.1 – 6.6 : Shear resistance of webs without and with stiffeners	11/0
14. Example 6.7 : Shear force resistance of orthotropic plate. Open or closed stiffeners	6/0
15. Example 6.8 : Shear force resistance of orthotropic double-skin plate	9/0
16. Example 7.1 : Concentrated force	4/0
17. Example 8.1 : Torsion constants for open cross section	6/0
18. Example 8.2 : Torsion constants for hollow cross section	3/0
19. Example 8.3 : Torsion constants for deck profile	3/0
20. Example 9.1 : Tension force and bending moment	6/0
21. Example 9.2 : Beam-column with rectangular hollow section	4/0
22. Example 9.3 : Beam-column with eccentric load	6/0
23. Example 9.4 : Beam-column with cross weld	7/0
24. Example 10.1 : Transverse bending of unsymmetrical flange	4/0
	Total :
	<b>282/92</b>

## 2000 Aluminium Design (AD, following 2)

	Pages / Figures
<b>2300 Static Design (end)</b>	
2302 Design of joints	126/123
2302 Appendix	16/0
<b>2400 Fatigue Design</b>	1/0
2401 Fatigue behaviour and analysis	81/56
2402 Fatigue loaded structures	61/36
2403 Applied fracture mechanics	49/40
2404 Quality considerations	51/29
Updating from Tas project:	
2405 Fatigue and Fracture in Aluminium Structures	40/38
2406 Fatigue and Fracture in Aluminium Structures : Proposal for a National Application Document	5/1
2406 – Annex 1	6/0
2406 – Annex 2	6/0
<b>2500 Design for Fire Resistance (Updated from TAS project)</b>	1/0
2501 Fire protection and regulation	16/16
2502 Material aspects of fire design	21/19
2503 Calculation methods for fire design	31/28
2504 Examples and applications	20/16
<b>2700 Design Examples</b>	
2701 Bridge deck	8/5
2702 Hoistable deck for ferries	10/7
2703 Construction and dynamic testing of aluminium nodes	13/10
2704 Member with requirement to fire resistance	8/6
Updating from TAS project	
2710 Static Design Example	82/0
2711 Design of a helicopter deck	11/7
2711 – Appendix	81/0
2712 Design Example in Fatigue – Based on European Standard ENV 1999-2 (Eurocode 9)	14/0
2713 Fire Design Example based on European Standard ENV 1999-2 (Eurocode 9)	27/0
	Total
	<b>703/437</b>

## **3000 Aluminium Machining and Forming (AMF)**

(32 modules, 585 pages, 597 figures, 38 text files, 32 overhead files)

	Pages / Figures
<b>3100 Machining of Wrought and Cast Aluminium Product</b>	1/0
3100 Machining of Products	38/31
<b>3200 Aluminium Casting Technology</b>	1/0
3201 Introduction to casting technology	29/44
3202 The liquid metal	16/13
3203 The filling of castings	22/21
3204 The freezing of castings	22/20
3205 The fluidity of molten metal	19/17
3206 The feeding of castings	24/23
3207 Solidification defects in castings	29/29
3208 The finishing of castings	22/17
3210 Continuous casting (new)	27/23
<b>3300 Fundamentals of Metal Forming</b>	
3300 Fundamentals of metal forming	18/27
<b>3400 Forging of Aluminium</b>	1/0
3401 Forging alloys	21/18
3402 Forging process	18/20
3403 Designing of forgings	17/18
<b>3500 Impact Extrusion of Aluminium</b>	1/0
3501 Alloys and properties	8/6
3502 Impact extrusion process	26/35
3503 Finishing and other supplementary operations	8/7
3504 Impact extrusion design aspects and properties	11/11
3505 Tools for impact extrusion	10/10
<b>3700 Forming Aluminium Sheet Metal Parts</b>	1/0
3701 Formability	28/30
3702 Tribology	13/12
3703 Stretch forming	13/10
3704 Deep drawing	15/16
3705 Drawing of automotive sheet metal parts	30/37
3706 Bending and folding	16/19
3710 Case study on can making	31/23
	Total :
	<b>536/537</b>

## **3000 Aluminium Machining and Forming (AMF, following 1)**

	Pages / Figures
<b>3800 Superplastic Forming of Aluminium Sheet</b>	1/0
3801 Manufacturing examples and fundamentals	14/20
3802 Physical mechanism of superplasticity	5/8
3803 Process technologies	15/21
3804 Superplastic alloys	5/5
3805 Combination of superplastic forming and diffusion bonding	7/6
	Total :
	<b>49/60</b>

# **4000 Aluminium Joining Technology (AJT)**

(23 modules, 303 pages, 321 figures, 27 text files, 23 overhead files)

	Pages / Figures
<b>4100 Mechanical Fastening Methods</b>	1/0
4101 Definitions and classifications	19/20
4102 Clinching	13/20
4103 Self-piercing riveting	8/7
4104 Application characteristics	15/18
4105 Combination of joining methods	16/19
4106 Quality assurance and process control	9/8
4107 General summary and future trends	12/12
<b>4200 Arc Welding of Aluminium and Aluminium Alloys</b>	1/0
4201 Arc welding process: TIG, Plasma arc, MIG	36/47
4202 Weldability	13/14
4203 Weld imperfections	10/9
4204 Design aspects	7/5
4205 Testing methods for welded joints	5/3
4206 Qualification	6/5
<b>4300 Beam Welding Processes of Aluminium</b>	14/14
<b>4400 Friction, Explosive and Ultrasonic Welding</b>	1/0
4400 Friction, Explosive and Ultrasonic Welding	11/11
4410 Friction stir welding	13/6
<b>4500 Resistance Welding</b>	23/25
<b>4600 Brazing, Soldering and Other Bending Methods</b>	1/0
4601 Introduction to brazing of aluminium alloys	27/19
<b>4700 Adhesive Bonding of Aluminium</b>	1/0
4701 Terms and definitions	4/20
4702 Factors influencing the strength of adhesive joints	13/13
4703 Design and calculation	9/10
4704 Surface preparation and application procedures	12/13
4705 Quality assurance	4/4
	Total
	<b>303/321</b>

## **5000 Aluminium Surface Technology (AST)**

**(11 modules, 188 pages, 130 figures, 15 text files, 10 overhead files)**

	Pages / Figures
<b>5100 Introduction Lectures on Aluminium Surface Treatment</b>	1/0
5101 Surface technology of aluminium alloys	13/10
5102 Reactivity of aluminium in aqueous solutions	13/10
5103 Forms of corrosion	20/11
5104 Prevention of aluminium corrosion	14/9
5105 Surface treatment of aluminium	15/15
<b>5200 Advanced Lectures on Surface Treatment Technologies</b>	1/0
5201 Pre-treatment of aluminium surface	12/0
5202 Conversion coatings	9/1
5203 Anodising of aluminium	27/24
5204 Organic coating of aluminium	16/8
5205 Plating on aluminium	19/23
<b>5300 Special Lectures on Aluminium Surface Treatments</b>	1/0
5301 Coil-Coating of Aluminium	27/19
	Total
	<b>188/130</b>

Total for the complete TALAT CD-ROM version 2.0:

**152 modules, 2940 pages, 2318 figures**