MEDICAL UNIVERSITY - FACULTY OF DENTAL MEDICINE – PLOVDIV
DEPARTMENT OF PROSTHETIC DENTISTRY

SYLLABUS

FOR DENTAL MATERIALS

1. Requirements for dental materials. National and international standards for dental materials.
2. Medico-biological requirements. Biocompatibility, bioacceptability. Tests for biological evaluation.
3. Structure of materials. Type of bonds.
4. Crystalline and amorphous materials.
5. Surface phenomena and adhesion to tooth structure. Adsorption, absorption and sorption. Wetting, capillary penetration.
6. Physical properties of materials.
7. Optical properties of materials: colour, transparency, translucency, fluorescence, opalescence.
8. Theory of colours – Munsell colour system for three dimensional characteristics of colours.
9. Shade matching in dental profession. Shade guides.
10. Factors that affect the colour determination. Metamerism.
11. Mechanical properties of materials. Strength of materials.
12. Hardness of materials. Methods for evaluation of hardness.
13. Technological properties of materials.
14. Classification of dental materials.
15. Metals and alloys. Precious and non-precious alloys.
16. Full insolubility in solid condition (mechanical mixture).
17. Full solubility in solid condition (solid solution).
18. Methods for evaluation of metals and alloys.
19. Noble metal alloys.
20. Gold alloys. Carat and fineness.
21. Silver dental alloys. Titanium.
22. Errors with processing of dental alloys.
23. Nickel-chromium alloys.
24. Cobalt-chromium alloys.

25. Cold working of alloys.

26. Heat treatment of alloys.

27. Heat sources.

28. Melting and casting. Methods of casting.

29. Spruing the wax pattern for casting. Investement.

30. Crystalization.

31. Homogenizing heat treatment. Diffusion, annealing, recrystallization.

32. Soldering.

33. Corrosion.

34. Oral electrogalvanism (polymetalism).

35. Classification of dental ceramic.

36. Ingredients for manifacture of dental porcelains.

37. Properties of ceramic materials. Glass transition temperature. Leucite and devitrification

38. Dental metal-ceramic. Porcelains with extremely low fusing temperature. Hydrotermal ceramic.

39. Alloys for metal-ceramic. Nickel allergy.

40. Technology of metal-ceramic and ceramic restorations: sintering, pressing, casting, cutting-CAD/CAM restorations.

41. Bonds between porcelains and alloys. Coefficient of thermal expansion.

42. Chemical properties of polymers.

43. Physical properties of acrylic polymers.

44. Characteristic of acrylic resins' monomer and polymer.

45. Polymerization of acrylic resins. Heat-cured acrylic.

46. Changes and defects of acrylic resins.

47. Cold-curing (auto-curing) acrylic resins.

48. Soft lining materials.

49. Fabrication of artificial teeth. Comparison between teeth made from porcelain and acrylic.

50. Temporary dental cements.

51. Zink phosphate cements.

52. Zink silicophosphate cements.

53. Zink polycarboxylate cements.

54. Glass ionomer cements.

55. Resin-modified glass ionomer cement (hybrid ionomers).

56. Composite restorative materials.

57. Compomers.

58. Traditional low-copper dental amalgams.

59. High-copper dental amalgams.

60. Impression materials. Requirements. Classification.

61. Hard impression materials. Gypsum impression material. Zink oxide–eugenol impression material. Self-curing impression materials.

62. Thermoplastic impression materials. Impression Compound. Guttapercha. Wax impression materials.

63. Reversible hydrocolloids (agar). Special devices.

64. Alginate (irreversible) hydrocolloids.

65. Condensation silicones.

66. Addition (vinyl) silicones.

67. Polyether.

68. Polysulfide.

69. Errors in processing and storage of impression materials.

70. Dental waxes.

71. Properties of dental waxes.

72. Gypsum products.

73. Plasters and stones. Setting reaction.

74. Thermoplastic modeling materials.

75. Investment materials. Refractory components and binder.

76. Gypsum-bonded investments.

77. Phosphate-bonded investments.

78. Ethyl silicate-bonded investments.

79. Technology of investing. Investment mould.

80. Fluxes and antifluxes.

81. Chemical cleaning of casting alloys- pickling.

82. Abrasive materials.

83. Abrasion, grinding.

84. Polishing.

85. Cutting effect of rotating instruments.

RECOMMENDED LITERATURE

1. Lectures for Dental Materials.
2. W.O'Brien. Dental materials and their selection, 4th ed, Chicago, Quintessence Publishing Co, 425 p.

01.05.2019 **Approved:** .....
/Prof. Ch. Kissov/